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ABSTRACT

Volume II, Section B of a six-volume final report (which covers the findings of a research project on policy and technology related to rehabilitation of disabled individuals) presents a review of literature on three types of behavior disabilities--epilepsy, mental retardation, and schizophrenia. Individual chapters on each disability cover the following: definitions and classifications; prevalence, incidence, mortality, and cost estimates; demographic distributions; etiology; life functioning deficits in the areas of health, motility, communication, cognitive-intellectual functioning, and social-attitudinal functioning; functioning as members of the community and labor force; technologies currently applied; and characteristics of the delivery system impacting the disability group. Bibliographies are also provided for each disability area. (SBH)

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ED149572

# HUMAN REHABILITATION TECHNIQUES

## A Technology Assessment

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Volume II
Part B

Supplemental Report:
Disability Analyses
Behavioral Disabilities

EC104166

# FOREWORD

This document is the second volume of the final report *Technology Assessment: Human Rehabilitation Techniques*, a project conducted at Texas Tech University by the Department of Industrial Engineering, the Research and Training Center in Mental Retardation, the Department of Systems, and the Technical and Professional Writing Program. The research has been conducted with the support of National Science Foundation grants ERP 75-10594 and ERP 75-10594 A01, monitored by the Directorate for Research Applications, Division of Exploratory Research and Systems Analysis.

Richard A. Dudek, Horn Professor and Chairman of the Department of Industrial Engineering has been a co-principal investigator and director of the project. Gerard J. Bensberg, Director of the Research and Training Center in Mental Retardation, and M. M. Ayoub, Professor of Industrial Engineering, have been co-principal investigators. Carol M. Sigelman and Andrew S. Martin of the Research and Training Center in Mental Retardation and Robert F. Powers of the Department of Industrial Engineering have been program managers for the project. James R. Burns and William M. Marcy of the Department of Systems have been in charge of the modeling used in the project. Technical writing has been performed by Charles W. Brewer and Cynthia E. Lyle of the Technical and Professional Writing Program. In addition, several research assistants and support personnel, as listed in the individual volumes of the study, have contributed to the project.

The project team wishes to acknowledge the efforts of individuals who have served on the Oversight Committee, Elizabeth Boggs, Kan Chen, Beatrix Cobb, Ronald Conley, Richard Herman, John Noble, Jr., Evan Vlachos, and Lester Wolcott; of Lee Phillips who served effectively as a program manager for a short time before leaving Texas Tech; of Brian Lambert who served as Work Session Conference Coordinator; of those who participated in the work-sessions chaired by Ted Hartman, David Malone, Blair Rowley, Evan Vlachos and John Wittman; and of Anne Seitz, the Secretary of the Project.

Although the National Science Foundation has supported this project, the findings, conclusions and recommendations expressed are those of the research team and do not necessarily reflect the views of NSF.

# PREFACE

This volume is a supplement to the final report of the project "Technology Assessment: Human Rehabilitation Techniques." It includes reviews of the literature on 14 disabilities selected for intensive case study in the project. The contents of Volume 2 are as follows, with disabilities grouped on the basis of similarities of effects on functioning:

### Section A--Motor Disabilities

| | |
|---|---|
| Stroke | Cathy Mannion |
| Spinal Cord Injury | Linda Vengroff |
| Cerebral Palsy | Cynthia Spanhel, Linda Vengroff |

### Section B--Behavioral Disabilities

| | |
|---|---|
| Epilepsy | Linda Vengroff, Melanie Schockett |
| Mental Retardation | Carol Sigelman, Linda Vengroff, Jerry Morris, Andrew Martin |
| Schizophrenia | Cynthia Spanhel, Melanie Schockett |

### Section C--Chronic Disease Disabilities

| | |
|---|---|
| Rheumatoid Arthritis | Cathy Mannion, Cynthia Spanhel |
| Coronary Heart Disease | Cathy Mannion |
| Emphysema | Jody Dixon |
| Carcinoma of the Colon/Rectum | Linda Vengroff |
| Kidney Disease | Cathy Mannion, Bernadette O'Farrell Ray, Linda Vengroff |
| Diabetes Mellitus | Linda Vengroff |

Section D--Sensory Disabilities

| | |
|---|---|
| Visual Impairment | Melanie Schockett |
| Hearing Impairment | Melanie Schockett |

These 14 disabilities were selected because they are prevalent, result in severe limitation, are chronic rather than acute, have survivors in need of rehabilitation, and affect a broad range of ages. The current literature on each disability was reviewed to determine: (1) definitions and classifications; (2) prevalence, incidence, mortality, and cost estimates; (3) demographic distribution; (4) etiology; (5) life functioning deficits in the areas of health, mobility, communication, cognitive-intellectual functioning, and social attitudinal functioning; (6) functioning as members of the community and labor force; (7) technologies currently applied; and (8) characteristics of the service delivery system impacting the disability group. The review papers vary in thoroughness as a function of the state of the literature about each disability and differences among the researchers doing the literature review. They reflect a first attempt at the ambitious undertaking of analyzing diverse handicapping conditions within the same analytical framework. The disability reports included in this volume provided the raw material for the cross-disability analysis reported in Working Paper 3, "Life Functions: Scope of the Problem of Disability," and in the final report Volume 1.

# VOLUME 2

## DISABILITY ANALYSES

VOLUME 2A - MOTOR DISABILITIES

VOLUME 2B - BEHAVIORAL DISABILITIES

VOLUME 2C - CHRONIC DISEASE DISABILITIES

VOLUME 2D - SENSES DISABILITIES

# VOLUME 2B

# BEHAVIORAL DISABILITIES

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# CHAPTER 1
# DISABILITY ANALYSIS: EPILEPSY

## I. Definition

The term "epilepsy" comes from the Greek work for seizure, and in ancient times the accompanying convulsions were thought to be the work of the spirits (Epilepsy Foundation of America, 1973). Today an understanding of the nature of the disease as well as a precise definition still eludes us.

The literature reflects this problem. One finds a variety of definitions and methods of classification of the disability termed epilepsy. Most of the definitions are descriptive in nature. This is due to the fact that epilepsy does not appear to have a specific etiology, nor is it the result of a specific anatomical disorder. Although during a seizure there is brain dysfunctioning, the cessation of a seizure results in the resumption of notmal brain activity, and the brain is not necessarily permanently damaged before or after a seizure (EFA, 1973). Another difficulty in obtaining a precise definition of epilepsy is that the disability takes many forms. It would in fact be more appropriate to discuss the disability of "epilepsies". However the difficulty with this term is that different forms of epilepsy are often found in combination, and it is more convenient to include all types under a unitary heading. "Just as we do not say the 'diabetes' we do not find it convenient to say 'the epilepsies'" (Boshes and Gibbs, 1972, p. 87).

The International League Against Epilepsy defines epilepsy as a "chronic condition of various etiologies characterized by recurrent epileptic seizures, no matter what clinical or laboratory signs and symptoms are associated" (Epilepsy Foundation of America, 1973). Similarly, epilepsy is defined by the Epilepsy Foundation of America (1974) as a "symptom of a disorder of the central nervous system characterized by sudden seizures due to abnormal electrical discharges of brain cells." (p. 5). According to these definitions, the primary characteristic of all forms of epilepsies are recurrent seizures; while individuals exhibiting isolated seizures are not necessarily epileptic (EFA, 1974).

A seizure is the result of abnormal electrical activity in the brain. However, the exact nature of these abnormalities is as yet unclear. There are a number of components involved in the generation of electricity in the brain cells, and according to Freeman (1975) dysfunctioning of any of these could result in a seizure. Seizures may be characterized by: (1) partial or total loss of consciousness; (2) mental confusion; (3) disturbances of CNS controlled bodily functions and (4) convulsions of the muscles (EFA, 1973). However, a seizure may vary in severity and does not always exhibit all the aforementioned characteristics (EFA, 1974). For example, convulsions do not necessarily accompany seizures (Boshes and Gibbs, 1972). In fact, the majority of epileptics do not have convulsions. A convulsion only occurs "...when the (electrical) discharge starts or spreads to a motor system." (p. 68). Thus, it is cautioned that the terms "convulsive disorders" and epilepsy are not synonymous. Some researchers believe epilepsy should not be considered a disease per se, but rather a group of symptoms (EFA, 1973; Boshes and Gibbs, 1972; Banay, 1961). For example, Sutherland et al. (1974) define epilepsy as a "symptom of excessive temporary neuronal discharge, due to intracranial or extracranial causes; it is characterized by clinically discrete episodes, which tend to be recurrent, in which there is a disturbance of movement, sensation, behavior, perception and/or consciousness" (p. 2). Furthermore, it should be emphasized that every brain is potentially epileptic though in some individuals there is higher probability than in others.

The definitional difficulties become more involved when an attempt is made to group the various types of epilepsy. Currently, there are three major schemes of classification. The most common scheme relies upon clinical features to classify types of seizures. According to Lees (1970), three major varieties are recognized: (a) petit mal; (b) grand mal; (c) focal.

Petit Mal. This term refers to the classical type of epilepsy which is associated with 3 per second spike and wave discharges (Lees, 1970). Literally, it means "little sickness" or "minor attack", and is not symptomatic of any recognizable brain disease (Merrit, 1967; National Institute of Neurological Disease and Stroke, 1972). A petit mal attack results in a loss of consciousness for 4 to 5 seconds, accompanied by cessation of speech and facial abnormalities (blank expression, pallor, and rolling upwards of the eyeballs). For several seconds the individual is non-responsive, neither speaking nor understanding the spoken word (Lees, 1970). In addition to being out of contact with the environment there may be a few clonic jerks of the arms of the eye muscles, as well as some loss of gross motor control. Rarely does the patient fall, even in the most severe attacks, but the patient may stagger a few steps or there may be loss of control of the urinary sphincter (muscle). Convulsions usually do not accompany petit mal attacks, though it should be noted that grand mal seizures sometimes accompany, precede or follow, the onset of petit mal (Lees, 1970).

Often conversation and activities are resumed immediately after the attack as if nothing had happened, or there may be a brief period of emotionalism. However, in some cases, the episodes are so mild and infrequent as to go unnoticed (Stephenson, McWilliam, Fisher, 1975). The subject may be unaware of some or even all of the seizures, or being totally aware of them, may not realize that they are of any significance (Lees, 1970). Petit mal attacks may follow each other in quick succession, though more often than not the attacks are separated by intervals of minutes, hours or days. It is possible though that repeated attacks can occur daily, as often as 100 times per day (EFA, 1974).

Grand Mal. Grand mal seizures are the most common type of convulsive phenomena, if the number of affected individuals is considered. It occurs in approximately 90% of epileptic individuals either alone, or in combination with other forms (Merritt, 1967, EFA, undated). However, petit mal is the most common form of seizure if the number of attacks per day is considered (Merritt, 1967).

During a grand mal attack, the patient experiences violent seizures which usually include convulsions, and complete loss of memory. Grand mal seizures las possibly a minute or more and can occur one or more times daily, weekly, monthly or annually. The patient loses consciousness, and usually falls to the ground with general convulsive movements of most or all of the body, often accompanied by irregular breathing and drooling. During the first part of the convulsion, a severe tonic spasm rapidly develops in the skeletal muscles, causing rigidity throughout the body. After a minute or two, convulsions, flexion, & extension spasms of the muscles begins (clonic phase). Hence the term tonic-clonic seizures is synonymous with convulsions. Many patients experience a premonitary sign, termed an aura, which can serve to predict a convulsion several hours before it occurs. However an aura may occur alone, being the only epileptic sign (Lees, 1970). An aura takes a variety of forms--visual, auditory, olfactory, or emotional, and the patient may experience sensations of anxiety, nervous tension, headache, twitching, nausea, shivering and fatigue (Lees, 1970).

In the post-seizure or post-ictal state the patient may be temporarily confused, complain of headache and muscle pain, vomit, be fatigued, or sleep for a prolonged period of time. Other phenomena appearing after a seizure include psychopathic behavior, amnesia, automatism (purposeless movement), and Todd's palsy (a temporary weakness or paralysis of the limbs). It should be noted that the latter effect is uncommon (Lees, 1970).

Focal Epilepsy. This term implies a seizure which originates in a particular part of the brain and produces symptoms related to that part. Focal attacks may produce effects related to one or more of the functions of the affected area of the brain (Lees, 1970). For example, a Jacksonian attact (a form of focal epilepsy) results when an epileptic discharge in the motor cortex produces involuntary movements. The focal attack can be limited to a specific localized area nad result in clonic movements in the affected muscles; or it can spread to involve the muscles of the entire half of the body.

Jacksonian attacks usually begin with convulsive twitchings in the toes of one foot, in the fingers of one hand or in the corner of the mouth. The duration of such an attack can range from a few seconds to several minutes; and more severe attacks can result in the loss of consciousness and experiences similar to that of a grand mal seizure (NINDS, 1975).

If the sensory cortex experiences a focal attack, sensory aberrations will occur. For example, contralateral paraesthesis, numbness, flashes of light, visual and olfactory hallucination, disturbances of the senses of reality and time (deja vu phenomenon).

Another form of focal epilepsy is temporal lobe epilepsy. The focus of abnormal electrical activity which precipitates a characteristic psychomotor attack is in the anterior portion of the temporal lobes (Merrit, 1967). Individuals suffering from psychomotor attacks exhibit a variety of behaviors: chewing and lip-smacking, pains and headaches, changes in color perception, spots before the eyes, buzzing and ringing in the ears, dizziness, fear, rage, anger. At times the manifestations appear so bizarre that the individuals appear hysterical or psychotic (EFA, undated). Psychomotor episodes and seizures may be mistaken for psychological behavior disorders (Merrit, 1967; Lees, 1970). A diagnosis of psychomotor episodes have legal implications as well, since patients may commit some misdemeanor or serious crime while they are having such attacks. Psychomotor seizures begin and usually end suddenly, while the intervening abnormal behavior is purposeless and unmotivated. The duration of the attack is short, usually seconds or minutes (Lees, 1970). It may, however last for several hours. After the seizure, the patient cannot remember what has happened during the attack (EFA, 1973; 1974). Psychomotor seizures are often associated with other forms of epilepsy. About one third of all those suffering from epilepsy are afflicted with temporal lobe seizures (Sutherland, et al., 1974).

Focal seizures occur almost exclusively in patients with gross organic brain pathology. Lesions may be microscopic or macroscopic in size and in more than 50% of the cases are the result of brain injury, infection or trauma (Merritt, 1967).

The three major groupings, petit mal, grand mal, and focal epilepsy consist of a number of more specific seizure types, some of which are discussed in the "Rare and/or Minor Seizure Types" section.

## Rare and/or minor seizure types

Abdominal epilepsy. Pain in the abdomen may occur as an aura in patients exhibiting seizures, and may be the only manifestation of the convulsive attacks. This is termed abdominal epilepsy. In some patients, there are brief periods of partial loss of contact with the environment. This type of attack usually occurs in grand mal seizure patients, who are receiving anti-convulsant therapy (Merritt, 1967).

Pyknolepsy. A term once used to describe a frequent series of petit mal seizures (numbering many hundreds each day). It appears there is no justification for this classification, since pyknolepsy does not differ from the usual case of petit mal (Lees, 1970; Merritt, 1967; Sutherland et al., 1974).

Infantile Spasms. This is a rare syndrome with onset in infants between the ages of 3 to 7 months. It is characterized by akinetic (sudden toneless episodes with falling) and myoclonic seizures (sudden involuntary muscular contractions of the trunk or limbs), and is associated with moderate to severe mental retardation. The initial symptoms include: nodding attacks (often mistaken for petit mal), jack knife attacks (in which the body suddenly flexes forward) or salaam attacks (characterized by upward movement of the arms and flexion of the trunk). The spasms usually occur in groups, several times a day and are generally momentary, hence the name "lightening seizures" (Merritt, 1967).

Febrile Convulsions. These occur in children below the age of three years, who have a nonspecific infection, and fever accompanied by a seizure. These seizures, usually reflect the young child's lowered seizure threshold and do not necessarily correlate with subsequent convulsive disorders. The tendency to have convulsions initiated by fever decreases by the age of three to five (Merritt, 1967).

Epilepticus. Patients who are subject to seizures may have attacks so frequently that they do not recover from the coma produced by one attack before the occurance of the next attack. The patient often remains in coma for 12 to 24 hours, during which time there may be many convulsive seizures. The attacks may cease spontaneously and the patient recover consciousness after a period of 24 to 48 hours, or death may occur as the result of the repeated attacks (Merritt, 1967).

## Difficulties with Clinical Classification

A number of epileptic patients manifest a combination of clinically classified seizures. For example, in a study of 586 out-clinic patients, 152 were subject to two or more types of attacks, while the remaining 434 manifested one type. The seizure most often represented was grand mal attacks which appeared alone or in combination with other types of seizures in 89% of the patients (Merritt, 1967).

A number of studies give further validity to this phenomena. Lennox (1969) reports 38% of those studies exhibited two or more seizure types, while Green (1970) notes that two out of three epileptics suffered from more than one type of seizure.

The classification scheme appears to be somewhat arbitrary, and the three types of seizures are certainly not mutually exclusive (see chart below). For example, temporal lobe epilepsy is a form of focal epilepsy, however it manifests certain typical petit mal characteristics. Epileptic aura, located under the petit mal heading, is considered to be an early warning sign of grand mal attacks, and therefore might possibly be placed under grand mal as well.

Petit Mal

1. temporal lobe epilepsy
2. epileptic aura
3. abortive grand mal
4. other focal seizures

minor attacks which may resemble petit mal

Grand Mal

Focal Epilepsy

1. motor (Jacksonian)
2. sensory
3. temporal lobe
4. myoclonic

Furthermore, Lennox notes that the syndrome of petit mal epilepsy consists of a triad of symptoms--myoclonic jerks, akinetic seizures and the typical petit mal attacks. However myoclonic jerks and akinetic seizures frequently occur in patients exhibiting grand mal seizure attacks (Merritt, 1967).

## Classification Based Upon Etiology

A second method of classification is based upon the etiology of seizures. Livingston (1972) identifies three epileptic categories based upon casual factors:

Symptomatic Epilepsy: Seizures which result from specific brain disorders, such as tuberous sclerosis, Sturge-Weber syndrome, and cerebral degenerative disease.

Secondary or Organic Epilepsy: Seizures which develop subsequent to demonstrable, permanent, nonprogressive nonspecific cerebral changes or damage. Included within this category would be seizures precipitated by head traumas due to birth or cerebral infections.

Idiopathic Epilepsy: The occurance of seizures through there is not demonstrable cerebral lesions. A variety of terms may be substituted for idiopathic: primary, crytogenic, essential, pure, true, or genetic.

While most researchers recognize the origins of epilepsy to be either acquired (e.g., by disease or trauma) or inherited (e.g., genetic) there are certain problems with the above terminology (Boshes, 1966). In fact Livingston (1972) holds that this type of classification system is "actually a fallacious method of division." This is especially true when distinguishing secondary from idiopathic epilepsy. One assumes seizures in patients with secondary (organic) epilepsy are due solely to cerebral damage. However it is obvious that some unknown factor or factors are responsible for epileptic attacks, if seizures occur in brains with structural as well as nonstructural damage. According to Livingston (1972), "It is reasonable to assume that some type of anatomic, physiologic or metabolic cerebral defect must be present in all patients with epilepsy. Actually, all that can be said is that the presence of cerebral lesions cannot be demonstrated with currently available medical techniques" (p. 4). Secondly, organic epileptics suffer only periodic seizures, and according to Livingston (1972), if cerebral damage were the only cause of convulsions, attacks would be continuous since the damage is permanent. In addition, not all children who sustain similar irreversible cerebral trauma (cerebral birth injuries) develop epilepsies. However, since there is a high incidence of recurrent seizures in patients with cerebral lesions, there is a high probability that damage to cerebral tissue plays some part in the cuasation of epileptic seizures, though the exact nature of its effect is still unknown.

Furthermore, Lennox (1960) points out the possibility that etiological distinctions are meaningless, since all forms of epilepsy have only one common factor, the predisposition to seizures, and only this should be used as the basis of a classification system.

A comparison of the clinical classification with the etiological classification results in the following: Petit mal epilepsy is considered to be idiopathic; grand mal epilepsy though frequently idiopathic is often considered to be symptomatic of brain disease; and focal epilepsy is usually identified as being symptomatic and/or secondary.

## International Classification of Seizure Types

The international classification of epileptic seizures was devised by Gastaut in 1970. The basis for this classification is the assumption that "...for every seizure there is a focus of abnormal neurons in the brain that precipitates the seizure." (Gallagher, 1975, p. 17). There can be multiple foci, but for any given seizure, the point of origination is in one focal area, which may subsequently spread to involve normal brain neurons. The location of the focus and the directional spread will determine the nature of the external manifestation (Gallagher, 1975).

Seizures are divided into two main categories: partial seizures and generalized seizures. A partial seizure involves the localized spread of abnormal neuronal activity which may or may not continue to spread to the rest of the brain. The generalized seizure, abnormal activity is noted in the entire brain (Gallagher, 1975).

Partial seizures are further divided into three subgrouping: (1) partial seizures with elementary symptomatology, including a number of focal seizures such as Jacksonian and sensory seizures, which are not accompanied by impairments in consciousness; (2) partial seizures with a complex symptomatology include temporal lobe (psychomotor seizures and are accompanied by some alteration of consciousness, and aberations in muscular movements; (3) the third subgrouping includes partial seizures which spread, thus becoming generalized.

Generalized seizures include petit mal seizures (also known as absence seizures) and grand mal seizures (tonic-clonic seizures).

In summary, there is a lack of consensus on a specific classificatory scheme for epilepsy. Currently, three methods are being utilized: clinical classification; classification based upon etiology; and the international classification of seizure types.

## II. Societal Characteristics of Epileptics

The literature provides information about the prevalence, incidence, mortality and costs associated with epilepsy.

## Prevalence

It is difficult to obtain accurate figures on the prevalence and incidence of epilepsy. This is due in part to the social climate regarding this disease. Many epileptics try to keep their condition a secret and it is not necessary to report a diagnosis of epilepsy in most states. Additionally, diverse definitions of epilepsy and methodological issues, such as sample selection, result in a wide variability of these rates. For example, a Great Britain study (1969) concludes that although 1 in 20 persons experience a seizure sometime in their life, only 1 in 8 of these develop chronic epilepsy. Thus, these figures are influenced by the definition of epilepsy. Furthermore, according to Van den Berg (1972) present epidemiological methods involved in prevalence and incidence data collection are unsatisfactory.

Early estimates based upon draft statistics from World War II, (Bailey et al., 1929, and World War II, Edwards et al., 1942) indicate that approximately one-half of one percent of the population (5 per 1,000 population or over 3/4 million people in the United States are affected. These reports, however, are probably not reflective of actual prevalence rates as "...in most cases an adequate examination may not have been made since the symptoms are relatively easy to hide, and only males were used in the samples" (EFA, 1975, p. 1). More recent studies report estimates of prevalence rates ranging from 2 to 22 per population. Livingston (1972) notes that the most commonly employed figure is 1 in 100 individuals.

Data compiled by Kurtzke et al., (1971) and the EFA (1975) demonstrates the diversity of prevalence rates throughout the world.

## TABLE 1-1

## CRUDE PREVALENCE RATES PER 1,000 POPULATION FOR CONVULSIVE DISORDERS

| Source | Region | Time | Prevalence Rate | # of Cases |
|---|---|---|---|---|
| Kurland (1959) | Rochester, MN | 1955 | 3.6 | 109 |
| Hauser et al. (unpublished data)[b] | Rochester, MN | 1960 | 6.2 | 242 |
| Hauser et al. (1970) | Rochester, MN | 1965 | 5.7 | 268 |
| Crombie et al. (1960) | England-Wales | 1957 | 4.2 | 1,209 |
| Brewis et al. (1966) | Carlisle, England | 1961 | 5.5[a] | 389 |
| Pond et al. (1960) | S.E. England | 1958 | 6.2[a] | 245 |
| Logan & Cushion (1958) | England-Wales | 1955 | 3.3 | 1,260 |
| Gudmudsson (1966) | Iceland | 1960 | 3.6 | 642 |
| Krohn (1961) | Northern Norway | 1960 | 2.3 | 951 |
| Henriksen (1969) with Krohn (1969) | Northern Norway | 1968 | 3.7 | 1,750 |
| Leibowitz & Alter | Jerusalem, Israel | 1961 | 4.1 | 689 |
| Lessell et al. (1962) | Guam | 1961 | 3.7 | 5 |
| Mathai et al. (1968) | Other Marianas | 1962 | 3.4 | 24 |
| Ueki & Sato (1964) | Niigata, Japan | 1958 | 1.5[b] | 191 |
| Levy et al. (1964) | Semokive, Africa | 1964 | 7.4[a] | 130 |
| Bird et al. ( 1962) | Bantu miners | 1961 | 3.7 | 1,347 |
| Dada (1968) | Lagos, Nigerai | 1967 | 3.1 | 8 |

[a] "Active plus "inactive" seizure disroders

[b] Review of limited sources of medical records

Sources: EFA (1975)

Additional sources cited by the EFA (1975) report the following prevalence rat

## TABLE 1-2

## CRUDE PREVALENCE RATES PER 1,000 POPULATION FOR CONVULSIVE DISORDERS

| Source | Sample/Cite | Prevalence Rate/1,000 |
|---|---|---|
| Baldwin et al. (1953) | State of Maryland | 2 |
| Wishik (1956) | 1,001 Georgia | 4 |
| Cooper (1965) | 5,000 Great Britain | 22.7[c] |
| Force (1965) | 318 Minneapolis, MN | 4.52 |
| Richardson et al. (1965) | Alamance Co., N.C. | 2 |
| National Center for Health Statistics (1967)[d] | United States | 3.1 |
| Wajsbort (1967) | Northern Ireland | 2.3 |
| Great Britain (1969) | Great Britain | 4.6 |
| Nowak (1972) | | 4.88 (urban) |
| | | 2.89 (rural) |
| Rose et al. (1973) | Washington Co., MD | 18.6 |

[c] Included febrile convulsions

[d] Unpublished data

Source: EFA, 1975.

An attempt by the Professional Advisory Board (PAB) of the Epilepsy Foundation of America to clarify the results of numerous studies dealing with prevalence rates for epilepsy resulted in the following figures: "at least two percent of the present population of the United States, or a minimum of four million persons, suffer from some form of epilepsy" (EFA, 1975, p. 3). Between 10-20% of the population may be latently epileptic (EFA, 1966, Current Information on Epilepsy). The National Institute of Neurological Diseases substantiates these figures, noting between 2 million and 4 million Americans suffer from epilepsy.

In summary, the variation in reported prevalence exists not only among countries but within countries. This phenomena may be the result of a number of factors: differences in methodological techniques, and definitions of epilepsy vary. However, the figure currently cited as the prevalence rate of epilepsy in the total U.S. population is 2%, or approximately 4 million individuals.

Incidence. Brewis et al. (1966) reviewed reports on the incidence of epilepsy and concluded that accurate estimates of incidence are difficult, due to the disagreement on how long an individual should be free of seizures or how many convulsions he should have before the diagnosis of epilepsy is made. Again it should be noted that legal discrimination and social stigma encourages epileptic patients to conceal their illness, thus creating additional problems in data collection. According to Bagley (1971):

> "Brewis and his colleagues, studying the incidence of neurological disease in an English City (Carlisle) defined epilepsy as the occurance of more than one epileptic-like attack, excluding febrile convulsions (associated with high temperature, and occurring before the age of 2), however long ago that attack occurred. By this definition, the lifetime incidence of epilepsy was found to be 0.55 percent. Gudmundson (1966) reviewed English, American and Scandinavian studies of incidence and reported rated varying from 0.3 percent to 0.3 percent to 0.9 percent." (p. 20)

The following table presented by EFA (1975) provides a survey of the literature on overall incidence rates. It also provides the number of new cases of epilepsy extrapolated from previous incidence rates, the range of new cases is from 23,144 to 147,282 per year.

TABLE 1-3

SURVEY OF THE LITERATURE ON INCIDENCE RATES PER 1,000

| Source | Incidence Rate | Estimated Number of New Cases in U.S./year[a] |
|---|---|---|
| Kurland (1959) | .31 | 65,225 |
| Krohn (1961) | .11 | 23,144 |
| Gudmundsson (1966) | .26 | 54,705 |
| Great Britain (1969) | .7 | 147,282 |
| Hauser, Karnes, & Kurland (1972) | .487 | 100,993 |
| Kallman & Sands (1965) | .4 | 84,161 |

[a] Number of new cases extrapolated from incidence rates.

Source: EFA (1975)

Eisner, Pauli and Livingston (1959), indicate that 1 out of every 50 persons will develop some form of epilepsy during his lifetime. They also note that in recent years there appears to be an increase in incidence and known number of persons with epilepsy.

Assuming the prevalence rate of 2% will remain constant, the EFA (1975), postulates 70,000 new cases of epilepsy each year in the U.S. The incidence rate, therefore, is projected at .2 per 1,000. However, there are indications that the prevalence rate may be increasing slightly (Tanaka & Armitsu, 1962; Great Britain, 1969). "Unfortuantely, as preventive medicine decreases the incidence of epilepsy due to prenatal and postnatal care and infections, the number of head injuries seems to be increasing due to accidents, especially traffic accidents" (EFA, 1975, p. 4)

Prevalence and incidence rates can be broken down further according to seizure type. For example, the most prevalent form of seizure, grand mal, occurs in more tha 80% of epilepsy cases (Gibbs & Gibbs, 1952; Lennox, 1960). Concomitantly, the figures for petit mal are quite low. Livingston, et al. (1965) reported only 364 (2.3%) of 15,102 epileptic patients had "true" petit mal; while Gibbs and Gibbs (1952) report 4% with petit mal and Lennox (1960) reports 9.7% (a relatively high figure). The situation is further complicated by the following: (1) seizure patterns may change with age; (2) one type of seizures may lead to another and therefore an individual exhibits multiple seizure types.

According to Lennox (1960) 62% of those with epilepsy manifest only one type of seizure, while 38% had more than one kind of seizure. However, Dr. John Green (1970) reports that two out of three epileptics suffer from more than one type of seizure. The frequency of seizures in approximately 600 patients has been analyzed by Merritt (1967).

TABLE 1-4

THE FREQUENCY OF VARIOUS TYPES OF SEIZURES IN 586 PATIENTS

| Type of Seizure | Alone | Associated with Other Types | Total | Percentage of 586 cases |
|---|---|---|---|---|
| Grand mal | 372 | 152 | 524 | 89 |
| Petit mal | 25 | 100 | 125 | 21 |
| Psychomotor | 37 | 33 | 70 | 12 |

Source: Merritt, 1967

Mortality. Inconsistencies in definition and biased samples have resulted in a distortion of epilepsy mortality figures. The major problem with the data is that it is impossible to identify persons with epilepsy who die from causes other than epilepsy.

The EFA (1975) has conducted a survey of the literature which deals with life expectancies of epileptic individuals. It is obvious that despite the increase in longevity due to the use of anticonvulsant drugs, the average life span of an epileptic is below that of the general population. Again, it is important to note that this data pertains only to identified deaths of persons with epilepsy.

TABLE 1-5

SURVEY OF THE LITERATURE ON LIFE EXPECTANCY

| Researcher | Year | Predominant Age at Time of Death |
|---|---|---|
| Lord* | 1899 | 40.53 |
| Habermaas* | 1901 | 25 |
| Spratling* | 1904 | 29.46 |
| Capp* | 1905 | 39 |
| Snell* | | 33 |
| Musson* | 1910 | 30 |
| Ammon* | 1912 | 25-30 |
| Pigott et al. | 1939 | 38.8 |
| Steinsiek | 1950 | 39.6 |
| Peiffer | 1963 | 35 |
| Henriksen | 1966 | 30-45 |
| Krohn | 1963 | 43.2 due to bronchopneumonia<br>32.8 due to mors subita<br>20.5 due to crowning |

*These references are quoted in Livingston, 1972, p. 600. Other refere[illegible]s were taken from Rodin, 1965, p. 157-165.

Source: EFA, 1975

Rodin (1968) compared data on the number and median age at time of death for all individuals in the state of Michigan with those individuals having epilepsy listed as the direct or contributing cause of death. These figures lend support to the contention that epileptics die at an earlier age than the general population.

### TABLE 1-6

### NUMBER AND MEDIAN AGE AT TIME OF DEATH DUE TO ALL CAUSES IN THE STATE OF MICHIGAN AS COMPARED WITH PATIENTS WHERE EPILEPSY WAS LISTED AS DIRECT OR CONTRIBUTING CAUSE OF DEATH

| Year | Total Deaths | Median Age at Death | Epilepsy | Median Age at Death |
|---|---|---|---|---|
| 1960 | 67,912 | 68.3 | 81 | 35.2 |
| 1961 | 67,375 | 68.7 | 74 | 40.8 |
| 1962 | 70,049 | 69.1 | 95 | 41.8 |
| 1963 | 72,438 | 69.3 | 91 | 34.7 |
| 1964 | 72,129 | 69.2 | 97 | 36.5 |
| 1965 | 73,665 | 69.5 | 109 | 41.8 |
| 1966 | 74,596 | 69.5 | 119 | 43.5 |

Source: Ernst Rodin, 1969

According to Singer (cited in Robb, 1968), insurance policy holders with epilepsy had mortality rates 2 to 3 times higher than expected. This agrees with a study conducted by Lund (1968) which found individuals who are disease free except for epilepsy, have a mortality rate nearly three times higher than that of non-epileptic persons.

Figures appear to indicate that mortality rates vary by race. However, according to Rodin (1972), differences in death rates by race probably can be attributed to social and environmental factors rather than genetic factors. Logan & Cushion (1958) cite the availability of medical care, increased exposure to accidents and lead poison as important variables influencing susceptibility to epilepsy and which are frequently functions of social class and racial inequality.

The probability of an individual dying from epilepsy classified by sex, race and age was computed by Methodist Hospital of Indiana, Inc. Table 1-7 presents the results. Blacks, both male and female, appear to have a significantly higher mortality risk due to epilepsy than whites, both male and female, in all age groups.

TABLE 1-7

CHANCE IN 100,000 OF AN INDIVIDUAL DYING FROM EPILEPSY (1968)

| Age | White Male | White Female | Black Male | Black Female |
|---|---|---|---|---|
| 5 | 3 | 2 | 6 | 5 |
| 10 | 7 | 4 | 13 | 10 |
| 15 | 9 | 6 | 25 | 14 |
| 20 | 12 | 7 | 32 | 18 |
| 25 | 10 | 6 | 47 | 21 |
| 30 | 11 | 5 | 73 | 26 |
| 35 | 13 | 8 | 87 | 31 |
| 40 | 13 | 10 | 87 | 24 |
| 45 | 12 | 8 | 77 | 20 |
| 50 | 5 | 3 | 62 | 12 |
| 55 | 0 | 0 | 27 | 0 |
| 60 | 0 | 0 | 0 | 0 |
| 65 | 0 | 0 | 0 | 0 |
| 70 | 0 | 0 | 0 | 0 |
| 75 | 0 | 0 | 0 | 0 |

Source: EFA, 1975, p. 11.

The age of onset of epilepsy and the type of epileptic attack an individual has influences mortality. Henrikson et al. (1970) reports that the earlier the age of onset of epilepsy, the higher the mortaility rate. For example, adults with onset after 30, had a nearly normal mortality rate. Furthermore, it was found that individuals having nocturnal grand mal attacks did not show higher than normal mortality rates (Henrikson et al., 1970).

When epilepsy mortality rates are classified by age, the highest risk group are those aged 25-29 and the lowest risk group are those individuals over 70 (Lennox, 1960). According to Kurtzke et al., (1973) epilepsy accounted for 0.5 deaths per 100,000 individuals under 15 years of age. Henrikson et al. (1970) and Lund (1968) note that the particularly high number of deaths between 20 and 55 years of age accounted for the excessive mortality rate among epileptics. Deaths were attributable to suicide, seizures, brain tumors and accidents.

Although it appears that epileptics, on the average, die earlier than non-epileptics, the number of individuals dying specifically from the disease is not significantly large. The Metropolitan Life Insurance Company (1951) reported that epilepsy was only a minor cause of death. In 1948, fewer than 2,000 deaths were officially cited as being due to epilepsy (1.3 per 100,000 general population). According to Kurtzke (1972) during the years 1959-1961, epilepsy accounted for approximately 1.2 deaths per 100,000 general population per year. Lennox (1960) reports that in 1955 while all deaths occurred at the rate of 1 per 1,000, deaths due to epilepsy were 1 per 566,600 general population.

## Costs

The federal government estimates the annual medical cost for epilepsy to be $2 billion (EFA, 1973). Data assembled by the Epilepsy Foundation of America which includes medical, social and economic costs indicate an annual rate of $4.37 billion (EFA, 1973). The following table itemizes the costs incurred by some programs and/or sources during 1972, and indicates the number of epileptic individuals served.

The largest cost is in the area of private medical expenses, which also accounts for the largest number of epileptics affected, 3,400,000. However, coming in a close second, in terms of cost, is the loss in wages. This category also affects the next largest group of epileptics, 450,000, though it runs a distant second tc private medical expenses category. This can be attributed to the fact that epilepsy is essentially a developmental disability initially afflicting many more children (non-wage earners) than adults (EFA, 1975).

A variety of programs contribute funds for the care and maintenance of persons with epilepsy. These organizations include: aid to the permanently and totally disabled; aid to the blind; aid to families with dependent children; vocational rehabilitation; social security; crippled children's program; medicaid; medicare; and the Veteran's Administration. A number of institutions also offer services to those suffering from epilepsy (see the Service Delivery section). Table 8 notes the exact costs incurred by these aforementioned organizations and institutions.

In the area of research, approximately $5.9 million is spent annually (EFA, 1973).

## TABLE 1-8

## AN ITEMIZATION OF THE COST OF THE EPILEPSIES TO THE INDIVIDUAL AND THE NATION

| Program/Source of Expenditure | Number of Persons | Annual Cost for Epilepsy (1972) |
|---|---|---|
| Aid to the Permanently and Totally Disabled | 49,984 | $ 70,266,690 |
| Aid to the Blind | 811 | 420,423 |
| Aid to Families with Dependent Children | 23,645 | 53,172,876 |
| Vocational Rehabilitation | 4,748 | 9,648,134 |
| Social Security | 43,300 | 65,038,880 |
| Crippled Children's Program | 18,460 | 4,700,000 |
| Medicaid | 94,000 | 31,300,000 |
| Medicare | Unknown | 125,300,000 |
| Veterans' Administration | 9,366 | 89,430,210 |
| State Special Education | 91,098 | 85,610,270 |
| Institutions (Psychiatric Hospitals, Institutions for Mentally Retarded, Residential Facilities) | 60,270 | 231,649,000 |
| Research | ---- | 5,895,252 |
| Wage Loss | 450,000 | 1,720,224,000 |
| Private Medical Expenses | 3,400,000 | 1,879,945,000 |
|  | TOTAL | $4,372,600,735 |

Source: Epilepsy Foundation of America, The Cost of the Epilepsies, Washington: Epilepsy Foundation, 1975 (p. 124).

## III. DEMOGRAPHICS

Age. Merritt (1967) notes that in the vast majority of epileptics, convulsive seizures begin before the age of 25. This is confirmed by Livingston (1972) who states that approximately 90 percent of all epileptic seizures start before 20 years of age. Similarly Lennox (1960) found that 84.1 percent have their first seizure before they reach 25. Rubio-Donnadieu (1972) reports 72.2% of his sample of 1552 epileptic patients had onset of seizures prior to 20 years of age.

Bridge (1949) and Dekaban (1959) reported that the onset of epilepsy is most frequent in the first two years of life and during adolescence. Likewise, Livingston (1972) found three specific periods when seizures were most likely to make their initial appearance: (a) during the first two years of life, (b) from 5 to 7 years of age, and (c) at the onset of puberty. According to Merritt (1967):

> "Convulsive seizures associated with organic lesions of the brain may have their onset at any age of life. The distribution of the curve of age of incidence is more even in these cases than in the cases of unknown cause, but like the latter, there are two peaks. The first is in the early years of life and the second after the third decade of life. The first peak is related to the fact that the developing brain of the infant or young child is much more apt to react with convulsive seizures when it is injured by trauma, by infections of the nervous system or by simple febrile illnesses. The second peak is related to severe head injuries and the neurological diseases of adult life (brain tumors, cerebral trauma and the like".

Livingston (1954) utilizing a sample of 4,158 children attending an epilepsy clinic recorded the years 5 to 7 as the most common age of onset for epileptic seizures. Epilepsy became less prevalent after the seventh year but increased in the eleventh and twelfth years. It is believed that the high incidence of onset of seizures during the first two years could be related to cerebral damage occurring prenatally or in association with birth while the reasons for the high incidence of onset from five to seven years are obscure, complex chemical and physiologic changes related to adolescence may account for the rise of seizures during the years eleven to twelve (Livingston, 1954).

Though no gross lesion can be demonstrated by clinical examination in many of the patients who have onset of seizures after age twenty, as a rule, the later the onset of seizures the greater the probability those attacks are associated with some gross organic lesions of the brain. However, it should be stated that:

> "...it is impossible to say unequivocably that the prevalence of epilepsy increases or decreases with age. Since prevalence rates are affected by incidence rates, it will be pointed out...that epilepsy with onset past age 20 is largely due to acquired causes. Thus differences in the prevalence rates listed...may be due to the environments of the various samples". (Epilepsy Foundation of America, 1975.)

Table 1-9 shows age-specific prevalence rates in Great Britain over a 6 year period.

TABLE 1-9

AGE-SPECIFIC INCIDENCE RATES IN GREAT BRITAIN (AVERAGE 1955-61)

| Age | Incidence per year |
|---|---|
| 0-4 | 0.75 |
| 5-9 | 0.36 |
| 10-14 | 0.44 |
| 15-19 | 0.53 |
| 20-29 | 0.22 |
| 30-39 | 0.16 |
| 40-49 | 0.21 |
| 50-59 | 0.22 |
| 60-69 | 0.16 |
| 70-79 | 0.08 |
| 80+ | |

Source: Epilepsy Foundation of America, 1975, (p. 6).

From twenty-five years of age to senility there is a small but fairly constant percentage for each decade in which seizures of unknown origin occur for the first time. Contrary to the general opinion no gross lesion can be demonstrated by clinical examination in many of the patients who develop seizures after the age of twenty years. As a rule, however, the later the onset of seizures the greater the probability that they are associated with some gross organic lesions of the brain (Merritt, 1967, p. 757).

Boshes & Gibbs (1972) report that the form of epilepsy which develops varies with the age of onset. However, grand mal seizures are still the most frequent in all groups. Petit mal most frequently occurs in the 5 to 9 age group. However, it does occur in all age groups at varying rates. Psychomotor epilepsy attacks appear to increase with age, though this type of attack is not as common as grand mal. It should also be noted that one type of seizure may lead to another and that seizures can occur in combinations in an epileptic individual.

Sex. The Epilepsy Foundation of America (1975) offers Table 10 with regard to prevalence of epilepsy in males and females. Furthermore Rubio-Donnadieu (1972) reports that among epileptic patients attending the National Institute of Neurology in Mexico, male epileptics outnumbered females, 54.8% to 45.2%. According to Epilepsy Foundation of America (1975), "While each position regarding sex prevalence has its proponents, it appears that the most recent work favors male prevalence by 1.2:1" (Kurtzke et al., 1971, p. 1). The reasons for this phenomenon are unclear though it may be partially due to the following: females can more easily hide their disability and/or males more commonly incur head injuries which are known to produce certain forms of epileptic attacks. It should be noted however that the occurrence of convulsive seizures is more frequent in females than males under 5 years of age; it occurs equally in both males and females for those in the 5 to 9 age group, but is more frequent in males 10 years and older (Merrit, 1967).

TABLE 1-10

SURVEY OF THE LITERATURE OF THE PREVALENCE OF EPILEPSY BY SEX

| Female Prevalence | Equal | Male Prevalence |
|---|---|---|
| Brain (1926) | Lennox (1947) | Gowers (1901) |
| Harvald (1954) | Metrakos & Metrakos (1961) | Kurland (1959) |
| Doose et al. (1963) | | Richardson (1959) |
| Livingston (1960) | Ya-Ko (1956) | Force (1965) |
| | | Dado (1968) |
| | | Leibowitz & Alter (1968) |
| | | Nowak (1972) |

Ethnicity. There is little data available on ethnicity characteristics of epilepsy. Figures which have been collected deal, for the most part, with the comparison of epilepsy as a cause of death, by race. It has been observed that the mortality rates are highest for blacks, both male and female. (See mortality section).

Kurtzke et al., (1971) reported that the death rate for epilepsy among nonwhites was more than twice the death rate for epilepsy among whites. The ratio of nonwhite to white deaths for those under 15 years of age was 2.3:1 and for those over 65, 2.5:1 (Kurtzke et al., 1971).

## TABLE 1-11

## THE FREQUENCY OF CONVULSIVE SEIZURES IN THE TWO SEXES ACCORDING TO AGE OF ONSET IN 1500 NONINSTITUTIONALIZED CASES

| Age at onset of Seizures | Number of females per 100 males |
|---|---|
| Before 5 years | 106 |
| 5-9 years | 100 |
| 10-19 years | 77 |
| over 20 years | 59 |
| Total | 77 |

Source: Merritt, 1967, page 756.

Geographic Region. Kurtzke et al., (1971) have compiled rates for epilepsy by state for the years 1959-61. There are excessively high epilepsy mortality rates in the south and east. The states which appear to be the most divergent from the mean are those states with small populations who rates are therefore less stable. In general, the range is rather small. However, when we consider data for whites alone, the southern excess in particular is no longer evident. Data for nonwhites alone indicates the predominance of epilepsy in the eastern and southern regions though the midwestern region has high death rates as well. The latter however, are based on small numbers. Furthermore, it should be taken into account that virtually all nonwhites in the southeast are black whereas the predominant nonwhite population in the midwest is American Indian.

## IV. Etiology

A great number of biochemical and physiological studies have been conducted to uncover the pathophysiology of seizures. Although the underlying causes of epilepsy remain a mystery, and the mechanism(s) in the environment which precipitate an abnormal discharge in the brain cells remain unknown, a number of disorders and factors have been identified as preceding the onset of epilepsy (Banay, 1961). Some of these factors can readily be identified and therefore are attributable to specific acquired factors; in other cases genetic factors appear to play a significant role; while in some cases the cause is undetermined. It has been postulated that an abnormal discharge can be the result of: defects in the brain; brain injury--before, during or after birth; head wounds; chemical imbalance; poor nutrition; childhood fevers; certain infectious diseases; brain tumors and poisons. In some instances, a specific cause cannot be suggested and therefore the epilepsy is termed idiopathic epilepsy.

One fact that is known, the etiology of epilepsy varies according to the age group. Approximately 90% of the total number of individuals with epilepsy develop the initial symptoms before the age of 20. More specifically, there are three periods during which the occurrence of seizures is most prevalent; during the first two years of life; from 5-7 years of age and at the onset of puberty (especially for females). The high incidence during the first two years may be related to cerebral damage occurring prenatally or in association with birth. The reasons for the high incidence of onset during the 5th to 7th years remains obscure though it might possibly be related to the identification of epilepsy upon entering school.

The high incidence during the 11th and 12th years may be related to complex chemical and physiological changes associated with adolescence (Livingston, 1972).

Duggin (1959) reports that in infancy and early childhood the main causes are congenital defects, birth injuries, and degenerative conditions. Idiopathic epilepsy (epilepsy in which the cause is unknown) usually manifests itself after the age of 4. The main causes of epilepsy in young adults are head injuries, traumas and birth injuries (in that order); while tumors, traumas and vascular disease are important causative factors during the adult years. It should be noted however, that late onset is not always the result of specific known cause(s). Livingston (1954) found that 78% of his sample with late onset reported no known cause of the epilepsy. Furthermore, Berlin (1953) reported 50% with unknown etiology (N=125) and De Saucy-Bayloye and Sorel (1959) noted 57% with unknown etiology (N=265) in their samples with late onset of epilepsy. According to the Epilepsy Foundation of America (1975) the rate of unknown etiology for late onset at 22-50% is still higher than the rate of unknown etiology of early onset (5.3 -29%). Table 1-12 identifies the causes of epilepsy according to age of onset.

A. Genetic Factors

Epilepsy per se is not inheritable, though a number of researchers believe one inherits a constitutional predisposition toward epilepsy. Boshes (1972) states, "...what is inherited is not some form of epilepsy, but a greater or lesser degree of resistance to the types of injury that produce epilepsy" (p. 2). The environment then acts upon this predisposition in such a manner that epilepsy will manifest itself.

## TABLE 1-12

## SUMMARY OF CAUSES OF EPILEPSY ACCORDING TO THE AGE OF ONSET

| Age | The Causes of Epilepsy at Various Levels of the Life Cycle |
|---|---|
| Prenatal | Abdominal Trauma; Premature Birth; Difficult Birth; German Measles; Subclinical Infections; Rh imcompatability; Toxemia of Pregnancy; Predisposition to a lower seizure threshold; Infectious Process; Other |
| Natal | Difficult Birth (Hypoxia Trauma); Congenital Defects; Inherited Metabolic errors; Other |
| Neo-Natal | Difficult Birth; Congenital Defeects; Inherited Metabolic Errors; Pyridoxine Deficiency; Fever; Subdural Hematoma; Postnatal Trauma; Other |
| Critical First Two Years | Difficult Birth; Congenital Defects; Inherited Metabolic errors (Phenyl Kentonuria Galectosemia); Allergy; Lead Encephalopathy; Infectious Diseases (Viral Encephalitis); Fever; Head Injury; Whooping Cough; Other |
| Pre School | Lead Encephalopathy; Head Injury; Whooping Cough; Fever; Other |
| Elementary School | Subacute Leucodystrophy; Head Injury; Infectious Diseases; Whooping Cough; Allergy; Other |
| High School & Adolescence | Head Injury; Brain Tumor; Birth Injury; Infectious Diseases; Other |
| Young Adult | Head Injury; Brain Tumor; Birth Injury; Other |
| Middle Age | Brain Tumor; Head Injury; Vascular Sclerosis; Other |
| Old Age | Brain Tumor; Vascular Insufficiency; Head Injury; Other |

Source: Adapted from National Spokesman, October, 1972, p. 10.

Various conditions may modify the effects of heredity. The incidence of a family history of epilepsy is lower (1.4%) in patients whose seizures developed following an injury than in those without a history of epilepsy (3.0%). Furthermore the familial incidence of epilepsy is greater in patients who seizures started early in life and in female patients (Merritt, 1967).

This issue is further complicated by the types of epilepsy one may manifest. It is thought that the method of genetic transmission varies according to epilepsy type. That is, different genes produce different epilepsies. For example, individuals with encephalic epilepsy and focal epilepsy appear to have irregular a-tosomal dominant genes (Bray and Wiser, 1965) while corteal dysrhythmia is believed to be inherited as a mendelian dominant factor (Lennox, Givvs & Givvs, 1940). Juberg and Hillien (1971) believe some forms of epilepsy are sex-linked. Prevalence figures however do not support a sex-linked gene argument.

Lennox and Lennox (1960) reported that even in symptomatic epilepsy, a form of epilepsy in which the precipitating organic factor is not known, a hereditary factor for epilepsy is sometimes present. Rodin and Gonzalez (1966) confirmed that motor epilepsy, which by definition involves an organic focal disturbance acquired through brain injury, has a strong hereditary component. Ounstead et al., (1966) reported similar findings and suggest that what may happen is that patients with hereditary epilepsy who suffer major seizures early in life, or a series of major seizures without recovery of consciousness in between seizures (status epilepticus) acquire damage to the temporal lobe which results in motor epilepsy. Clinical and electroencephalographic studies of identical twins indicate that hereditary factors increase the risk of epilepsy one to fifty times (Lennox, 1951; 1960). Genetic factors have been found to operate even among persons with focal seizures (Bray and Wiser, 1964), and among those with post-traumatic epilepsy (Walker, 1949). Metrakos and Metrakos (1961) have reported a 12 per cent incidence of epilepsy in close relatives of petit mal patients and a 45 per cent incidence of spike and wave patterns in the electroencephalograms of siblings of petit mal epileptics, when recordings were made between 4.5 and 16.5 years of age. Further, a high incidence of diencephalic types of seizure discharge has been reported by several investigators among the near relatives of patients with such a disorder (Rodin, 1964; Fois, Borgheresi and Luti, 1967; Peterson & Akesson, 1968).

According to Boshes (1972) one in ten cases of epilepsy had a history of epilepsy among near relatives (i.e., siblings, parents, grandparents, aunts or uncles). However among patients with febrile convulsions, one case in four has a near relative with a history of febrile convulsions; while the incidence of essential epilepsy in family histories is three times greater than the occurence of symptomatic epilepsy in family histories. Harvald (1954) reported the rate for essential epilepsy was four times greater than for symptomatic epilepsy.

Information gathered by Lennox indicates that a history of recurrent seizures was present in 2.7 per cent of the 12,119 near relatives (parents, siblings and children) of 2,130 epileptic patients. These figures indicate that the offspring of an epileptic parent has about 1 chance out of 40 of acquiring epilepsy; while the probability is 1 in 200, that a nonepileptic parent will have an epileptic child (Merritt, 1967). Gastaut (1969) reported 50% of the offspring of parents with generalized epilepsy also developed epilepsy. Yet, Kranmerer (1952) reported only a 3-8% probability of descendants of epileptics manifesting epilepsy and conversely a 92-97% probability of no manifestation of the disease.

Metrakos & Metrakos (1969, 1970), Lennox (1951) and a number of other researchers have conducted studies comparing the incidence of epilepsy and/or abnormal EEG's in families of epileptics to families of control groups. It was found that there was a statistically higher incidence of epilepsy in epileptic patients' families than in families of the control group. Metrakos and Metrakos (1970) noted that 10% of the parents, and 37% of the siblings and offspring of epileptic patients had abnormal EEG's compared to 2% of parents 5% and siblings and offspring for the control group(EFA, 1975). Earlier reports noted that between 26% and 37% of patients with epilepsy have a family history of the disease (Gowers, 1901; Turner, 1910; Brain, 1926). More recently, researchers have recorded even higher percentages of abnormal EEGs among relatives of epileptic individuals. For example, Lennox (1947) found that 50% of epileptic's relatives had abnormal EEG's as compared to 16% of the control group; while Alderman and Metrakos (1969) indicated 38.4% of 216 relatives of 48 patients with focal epilepsy had abnormal EEG's compared to 20.9% of 258 relatives of control patients.

### B. Biochemical Disorders

Biochemical disorders which can be inherited may possibly result in epilepsy. What is specifically inherited is an enzyme defect which leads to a general biochemical disturbance in the brain. Thus generalized seizures are more often inherited, while focal lesions are usually associated with lesions in the cerebral hemisphere. Wright (1975) suggests that a genetic predisposition may determine whether or not a focal lesion results in epilepsy, but the relationship is less striking than in cases of generalized seizures.

Epilepsy is frequently associated with mental retardation when biochemical disorders are the causative agent. Further, physical deformities may accompany patients with biochemical disorders due to the fact that alterations in the body's basic building materials result in changes in organs other than the nervous system. When more than one member of a family is afflicted, the chance of finding an inborn metabolic error is enhanced.

On the other hand, some metabolic diseases, such as abnormally low levels of calcium or glucose in the blood, may be causes of convulsive seizures without any basis in heredity. These are easily corrected, are routinely looked for, and their correction frequently leads to cessation of seizures.

## C. Prenatal, Natal and Neo-Natal

Birth or perinatal causes of epilepsy include birth trauma, inadequate oxygen to the brain, bleeding into the brain, blood incompatability with jaundice in the newborn, or low blood sugar levels. The premature infant is more likely to be affected than the full-term infant by infection, subnormal body temperature, hemorrhage, and brain damage due to jaundice. Though the cause may be at or near the time of birth, seizures may not appear for many years.

The role congenital defects play in causing epilepsy are difficult to evaluate, though among the known contributing factors are failure of the brain and nervous system to fully develop. Congenital infections such as toxoplasms and cytomegalic inclusion disease are common, while congenital syphillis is now rare but can cause epilepsy in the infant. Seizures may also be due to congenital or inborn errors of metabolism such as phenylketonuria, Niemann-Pick disease, and Tay-Sachs disease (EFA, 1974).

D. Head Injuries

Rapport and Penry (1972) estimate that in 1970 5% of the 2 million civilian head injuries (the majority due to automobile accidents) and 30% of the 5,000 military casualties with head injuries developed seizures. This results in a total of 101,500 new cases of epilepsy due to head trauma for the year 1970. Caveness (1971) notes an even higher estimate of 200,000 new cases of epilepsy due to head trauma (EFA, 1975). According to Walker (1962), the probabilities that a head injury will lead to epilepsy is 1 in 4.

Seizures may occur immediately after a head injury or after considerable time has passed. The development of seizures after a head injury depends on the severity and depth of the wound and its location. Penetrating wounds are more apt to produce seizures than superficial wounds. If the sensory organs are affected or if infection sets in, the probability of epileptic seizure is greater. Furthermore, the longer a patient remains unconscious after the injury, the greater the chance of seizure. Walker and Jablon (1959) report that the onset of epilepsy after a head injury is influenced by the dimensions of the wound, length of unconsciousness after injury, amount of neurological impairment, presence of intracranial foreign bodies and all factors tending to delay healing.

E. Infectious diseases

Next to perinatal injury, infectious diseases are the most common cause of seizures starting in childhood. Among common infectious childhood diseases, measles is the worst offender. Approximately 30% of supposedly uncomplicated cases of measles show diffuse very slow activity in the EEG during the acute and postacute phases of the illness (Gibbs et. al., 1959). If the EEG remains normal, prognosis is excellent. However, if the EEG is slow during the acute phase, the prognosis is not so favorable. With the passage of time, this diffuse slowing may change to focal slowing or spiking or both. Many months or years after a spike focus has developed, the child may have his/her first convulsion and unless spiking clears up; he is likely to have recurrent seizures afterward (Boshes & Gibbs, 1972). A number of other infections can lead to long-term complications. For example, postinfectious encephalitites, particularly those following vaccination, rabies innoculation, or measles, are likely to lead to permanent brain damage with a persistent convulsive disorder. Meningitis, particularly in childhood, can result in focal or generalized convulsive seizures. Parasitic infections of the nervous system are a common cause of seizures in countries where cysticercosis and echinococcosis (due to tapeworm larvae and cysts) account for a high proportion of chronic sufferers with epilepsy. In most instances the lesions are focal, intracerebral, and intractable. (Wright, 1975).

F. Intoxication (poisoning)

Any substance that interferes with oxygenation, the supply of glucose to the brain or oxidative metabolism will cause seizures by disrupting the normal membrane equilibrium that is dependent upon metabolic integrity. The causative agents included within this category are poisonous substances that can enter the body from outside (exogenous toxins). These substances include convulsant drugs (pictotoxin, Metrazol, camphor and strychnine), as well as certain metals.

Two substances that frequently cause seizures are alcohol and lead. Alcohol tends to produce acute episodic seizures which may occur immediately after, or within 48 hours of, drinking large quantities of alcohol. An individual's sudden withdrawal of alcohol or depressant drugs, especially barbiturates can also induce seizures. Further, an overdose of drugs, both stimulants and depressants, can bring on convulsions which may or may not be epileptic in nature (Wright, 1975).

Lead is a dangerous metallic poison which can lead to epileptic seizures. Lead intoxication is predominantly a disease of children. Children are often exposed to this toxin by chewing lead paint from walls, ceiling, woodwork or cribs (Boshes and Gibbs, 1972). Lead accumulator batteries can also result in lead intoxication as the result of the inhalation of lead fumes. Lead encephalopathy in children is often followed by motor and mental retardation and persistent seizure disorders. In the adult, brain disease with seizures is less likely to develop due to the ingestion of lead (Wright, 1975; EFA, 1974).

### G. Brain Tumors

Although not all brain tumors result in epilepsy, a definite relationship has been established between brain tumors and epilepsy (EFA, 1974). Jennet and Lewin (1960) reported that less than 10% of brain tumor cases developed epilepsy after blunt head injury. A combination of depressed fracture and post-traumatic amnesia created an increased risk of persistant seizures. The incidence of seizures following open or closed craniocerebral injuries is considerable and appears to be increasing, apparently along with the increase in traffic accidents and war injuries during the

Vietnam conflict. According to Penfield and Humphrey (1940), the incidence of epilepsy is highest in cases of depressed fracture, meningocerebral laceration and drained and healed abscesses (Boshes & Gibbs, 1972).

In a study conducted by Lennox (1960), 4% of the epileptic adults were found to have brain tumors. This compares with a figure of 1% noted by Gibbs and Gibbs (1952) from a total of 11,612 epileptics. Bridge (1949) found no case of brain tumor among the 742 epileptic children studied. Penfield and Erikson (1941) cite six authors who reported a 29-39% incidence of seizures in cases of proven brain tumor.

## V. Life Functions

Health. There are a number of health problems specific to the various seizure types. Generalized convulsive seizures, more specifically status epilepticus, cause a variety of health problems. If convulsions continue coma deepens, pyrexia (fever) and hyperpyrexia develop, signs of stress may develop in the heart, lungs and kidneys, electrolyte imbalance may occur, and there is a possibility of death (Sutherland, Tait & Eadie, 1974).

Those individuals having temporal lobe seizures, often experience an epigastric sensation. This somatic hallucination, which is usually an unpleasant, peculiar sensation, often described as fear, begins in the epigastrium (abdominal area) and appears to rise in the chest moving toward the throat. It may be associated with involuntary swallowing and sensations in the mouth and lips. (Sutherland, Tait & Eadie, 1974).

Individuals having grand mal seizures become weak and lapse into coma; and with the return of consciousness, drowsiness and complaints of headaches are common (Sutherland, Tait & Eadie, 1974).

In addition to health problems resulting from the physiological manifestations of seizures, a number of problems are related to the treatment of the seizures by anticonvulsant drug therapy. In order to adequately control seizures, some patients require dosages of medication which keep them constantly drowsy and somewhat irritable. According to Livingston (1972), most epileptic patients would be better off leading a normal life with occasional seizures than being seizure free in a perpetual state of drug-induced drowsiness and/or confusion.

At times there are idiosyncratic or hypersensitivity effects, which most commonly involve skin rashes, but may also involve the blood forming mechanisms, as well as other organs, e.g., kidneys. Since some drugs may affect blood formation or renal function, periodic blood counts and urinanalysis are often required (Sutherland, Tait & Eadie, 1974).

Megaloblastic anemia may occur in patients receiving phenytoin, primidone, or very rarely, phenbarbitone. When taken over a period of time, these drugs may interfere with folic acid production thus producing megaloblastic anemia. This can be compensated for by oral injection of folic acid. Prolonged anticonvulsant therapy with phenytoin, phenobarbitone or primidone may also be associated with a fall in serum calcium concentration, and the occasional occurrence of osteomalacia. It is believed that anticonvulsant drugs accelerate the metabolism of vitamin D and so produce a relative vitamin D deficiency state (Sutherland, Tait & Eadie, 1974).

According to Livingston (1972), the incidence of untoward reactions associated with phenobarbital therapy is minimal. Not one of the 15,000 patients for whom phenobarbital drugs were prescribed exhbited reactions which caused serious and irreversible damage. The only significant untoward reactions were: (1) drowsiness, (2) hyperactivity and excitation simulating the hyperkinetic syndrome, (3) an occasional rash, and (4) in certain cases, difficulties in calcium metabolism, fetal development and blood coagulation in the neonate (Sutherland, Tait & Eadie, 1974).

Phenobarbital overdose usually causes drowsiness, and in some epileptic patients receiving relatively large doses of the drug, there is some speech impairment (a dysarthric-like state), though this is probably related to excessive drowsiness. Although phenobarbital is considered a sedative, it has the opposite effect in some epileptic patients, particularly children. They become restless, irritable and "mean". It is believed this form of reaction is due to drug sensitivity rather than overdosage. Cutaneous skin rashes, morbilliform (measle-like) and urticarial, while they do occur after the administration of phenobarbital, are rare (Livingston, 1972). There is also a problem with lethargy, which occurs during the first few weeks of barbituate drug therapy but eventually subsides (EFA, undated).

The succinimide group of anticonvulsant drugs produce in some patients gastrointestinal upsets (anorexia, vomiting, nausea), an allergic rash, lethargy (sometimes amounting to a dreamlike state), pancytopenia, leucopenia and aplastic anemia (Sutherland, Tait & Eadie, 1974).

Proxidone (tridione) and paramethadione (paraxtione) manifest similar symptoms: aplaatic anemia, skin rashes, neutropenia and nephrosis (Sutherland, Tait & Eadie, 1974).

The side effects of primidone (mysoline) include occasional rashes, megaloblastic anemia and leucopenia, and a tendency toward hypersomnia (uncontrollable drowsiness), especially at the beginning of treatment (Sutherland, Tait & Eadie, 1974).

Carbanezepine (tegretol), may produce allergic skin reactions, drowsiness, dry mouth and gastrointestinal disturbance. Jaundice and fatal aplastic anemia have also been known to occur, due to this usage of this drug (Sutherland, Tait & Eadie, 1974).

The most important limiting factor in sulthiame therapy is the occurrence of side effects. Although in many patients these symptoms subside in one or two weeks, ten per cent of the users of the drug discontinue the medication. The side effects manifested include: gastrointestinal upset, headache, hyperventilation, paraesthesia, drowsiness and mental confusion (Sutherland, Tait & Eadie, 1974).

Hypertrophy of the gums is quite common in children taking dilatin (diphenylhydantoin). Abnormalities in the gums vary from slight swelling to marked hyperplasia which almost totally covers the teeth (EFA,undated). Other side effects of phenytoin (dilatin, epanutin) include: dermatitis, a hypersensitivity reaction occurring in combination with fever and eosinphilia; systemic lupus erythematosis; hirsutism, particularly on the limps; blood disturbances including leucopenia, agranulocytosis, thrombocytopenia and aplastic anemia, and lymphadenopathy (Sutherland, Tait & Eadie, 1974).

Actazolamide (dianox) causes a number of side effects, however, they do not occur with great frequency. These are: gastrointestinal disturbances, flushes, headache, fatigue and paraesthesia. There is also a slight risk of calculi formation and renal colic (Sutherland, Tait & Eadie, 1974).

There are some acute toxic reactions which occur with increases in the dose or serum concentration of diphenylhydantoin. These also occur with new exposure to the drug. These reactions include nystagmus (jerking eye movement which produces difficulty in the ability to focus one's vision and may also produce double vision). Ataxia is another toxic reaction which involves difficulty in maintaining balance (Gordon, 1975).

There are a variety of other toxic reactions that can occur in susceptible individuals. The incidence is not great however. These include collagen diseases such as systemic lupus erythematosis; suppression of bone marrow function resulting in various types of anemias; and decreased white blood cell count. There are also a number of dermatalogical reactions that can occur with exposure to these drugs. These may vary from a skin rash to a syndrome called exfolitive dermatitis in which the entire skin is destroyed. Such a reaction may be fatal (Gordon, 1975).

## Mobility

Problems in the mobility life function, often involving repercussions of dizziness and incoordination, are reported in the mobility life function table.

## TABLE 1-13
## LIFE FUNCTION - EPILEPSY: HEALTH

| Statement of Problem | Dynamics | Source |
|---|---|---|
| Lethargy | Side effect of barbiturates in first week of therapy side effect of acetazdamide (Diamox) & Carbamazepine (Tegretol) | EFA, and Sutherland, et. al., 1974 |
| Sedation, fatigue | Side effect of phenobarbitone, benzodiazepines, proxidone (Tridione) & paramethadrone (Paradrone) | Sutherland, et. al., 1974 |
| Gastrointestinal upsets - anoretia, vomiting, nausea | Side effects of succinimides; phenytoin (Dilantin: Epanatin) - in early days of treatment side effects of acetazolamide (Diamcx), carbamazepine (Tegretol), & Sulthiame (Ospolot) | Sutherland, et. al., 1974 |
| Nausea | May occur at the site of administration of anti-convulsant drugs | Sutherland, et. al., 1974 |
| Allergic skin rashes | Side effect of succinimides, proxidone (Tridione), paramethadione (Paradione), primidone (Mysoline), carbamezepine (Tegretol) & phenobarbitone | Sutherland, et. al., 1974 |
| Lethargy - sometimes amounting to dreamlike state | Side effect of succinimide group | Sutherland, et. al., 1974 |
| Pancytopenia - deficiency of all the cell elements in blood; aplastic anemia | Side effect of succinimides, proxidone (Tridione), paramethadione (Paradione) | Sutherland, et. al., 1974 |
| Leucopenia - reduction in the number of leukocytes (white blood corpuscles) in the blood | Side effect of succinimides, & primidone (Mysoline) | Sutherland, et. al., 1974 |

TABLE 1-13, CONT'D.

| Statement of Problem | Dynamics | Source |
|---|---|---|
| Grand mal attacks | May be evoked by ethosuximide (Zarotin) of succinimide group | Sutherland, et. al., 1974 |
| Neutropenia - decrease in number of neutrophilic leukocytes in blood | Side effect of proxidone (Tridione) & paramethadrone (Paradrone) | Sutherland, et. al., 1974 |
| Jaundice | Side effect of carbamazepine | Sutherland, et. al., 1974 |
| Hypersomnia - uncontrollable drowsiness | Side effect of primidone (Mysoline) esp. at beginning of therapy | Sutherland, et. al., 1974 |
| Fatal aplastic anemia | Side effects of carbamazepine (Tegrotol) | Sutherland, et. al., |
| Effects on folic acid - Vitamin $B_{12}$ metabolism possibly resulting in megaloblastic anemia | Side effect of primidone (Mysoline) & phenytoin (Dilantin) after taken a number of years | Sutherland, et. al., 1974 |
| Possible effects on calcium metabolism, total development & blood coagulation in neonate | Side effect of phenobarbitone | Sutherland, et. al., 1974 |
| Dermatitis - hypersensitivity reaction, may occur with fever | Side effect of phenytoin (Dilantin: Epanatin) | Sutherland, et. al., 1974 ( & EFA, nd) |
| Systemic lupus erythematosus (erythema - redness of skin produced by congestion of capillaries) | Side effect of phenytoin (Dilantin: Epanatin) | Sutherland, et. al., 1974 (& EFA, nd) |
| Hirsutism - abnormal hairiness especially in women | Side effect of phenytoin (Dilantion: Epanatin) - especially on limbs | Sutherland, et. al., 1974 (& EFA, nd) |

TABLE 1-13, CONT'D.

| *Statement of Problem* | *Dynamics* | *Source* |
|---|---|---|
| Blood disturbances<br>leucopenia<br>thrombocytopena - decrease in number of blood platelets<br>agranulocytosis - acute desease marked by leukopenia & neatropania with ulcerative lesronsot throat & other mucous membranes of gastrointestinal tract | Side effect of phenytoin (Dilantin: Epanatin) | Sutherland, et. al., 1974 |
| Hypertrophy of gum - ranges from slight swelling to marked hyperplasia (abnormal increase in number of cells composing a tissue) almost covering the teeth | Side effect of Dilantin - especially common in children | EFA, nd; Sutherland, et. al., 1974 |
| Death - produced by exhaustion & increased metabolism due to seizures | Status epilepticus (a state of frequently recurring generalized focal - motor convulsions) = medical emergency | EFA, 1966 |
| Osteomalcalcia - marked by softening of the bones, with pain, tenderness, muscular weakness, anorexia & loss of weight from vitamin D deficiency | Prolonged anti-convulsant therapy with phenytoin, phenoloavbitone or promidone | Sutherland, et. al., 1974 |
| Hypoglycemia - reduction of blood sugar | Prolonged anticonvulsant therapy with phenytoin, phenobarbitone or primidone, may be associated with a full in serum calcium concentration. May accelerate vitamin D metabolisum & so produce vitamin D deficiency state | Sutherland, et. al., 1974 |
| Headache; drowsiness | Towards end of major seizure with the return of consciouness | Sutherland, et. al., 1974 |

TABLE 1-13 CONT'D.

| Statement of Problem | Dynamics | Source |
|---|---|---|
| Cardiac or respiratory arrest | Side effect of therapy for status epilepticus with an hypnotic agent | Sutherland, et. al., 1974 |
| Hyperventilation | Side effect of sulthiame (ospolot) | Sutherland, et. al., 1974 |
| Lyphadenopathy - disease of lymph nodes | Side effect of phenytoin (Dilantin: Epanatin) | Sutherland, et. al., |
| Congenital Malformation | Risk is double that of gen. population for patients treated with phenytoin or phenobarbitone | Sutherland, et. al., 1974 |

## TABLE 1-14
## LIFE FUNCTION - EPILEPSY: MOBILITY

| Statement of Problem | Dynamics | Source |
|---|---|---|
| Incoordination of hands; ataxic gait | Benign petit mal status | Sutherland, et. al., 1974 |
| Myoclonic spasm - shock like contraction of muscles | Benign petit mal status; focal motor status | Sutherland et. al., 1974 |
| Muscle hypotonus - a condition of abnormally diminished tone, tension or activity | Side effects of benzodiazepones | Sutherland, et. al., 1974 |
| Ataxia - failure of muscular coordination; irregularity of muscular action | Side effects of benzodiazepines; Primidone (Mysoline) - may occur during last few days of treatment | Sutherland, et. al., 1974 |
| Vertigo - dizziness; a hallucination of movement | Side effect of Primidone (Mysoline) - occur last few days of treatment | Sutherland, et. al., |
| Primary automatism (automatism = performance of non-reflex acts without conscious volition) | Symptom of temporal lobe seizures - may be the sole epileptic manifestation or may occur as a prelude to a major seizure | Sutherland, et al., 1974 |
| Secondary automatism | Commonly follows major seizure | Sutherland, et. al., 1974 |
| Rigidity | Outset of grand mal, major seizures | Sutherland, et. al., 1974 |
| Intense spasms & jerking of face, limbs & trunk | A number of seconds after onset of grand mal, major seizure & generalized convulsion | Sutherland, et. al., 1974 |
| Comatose | Gradually after spasms of major seizure subside | Sutherland, et. al., |

TABLE 1-14, CONT'D.

| Statement of Problem | Dynamics | Source |
|---|---|---|
| Nystagmus - involuntary, rapid movement of eyeball | Produced as therapeutic levels of phenytoin (Dikintin: Epamitin) are being sought | Sutherland, et. al., 1974 |
| Paresthesia - morbid sensation, as burning prickling | Side effect of autazolamide (Diamex) & sulthiame (ospolot) | Sutherland, et al., 1974 |
| Primary behavioral disturbance hypermotility - gross motor activity | | Bradley, 1907 |

Social-Attitudinal. The behavioral aberrations exhibited by epileptic patients may be precipitated by a variety of factors, alone or in combination: (1) manifestations of the disease itself; (2) mismanagement of the patient in the home and/or community; (3) restrictions and prohibitions associated with epilepsy: (4) societal attitudes toward the epileptic population; (5) idiosyncrasy, overdosages, or adverse reactions to antiepileptic drugs (Livingston, 1972).

According to Bradley (1951) and Marzuoli (1955) epileptic behavioral disturbances are two-fold: primary behavior disorders, which are specific disorders related to cerebral dysfunction; and secondary behavior disorders which result from the child's reaction to his/her seizure attacks, as well as his/her family's and the community's response to the disorder. (See community section for secondary behavior disorders )

Investigators report a number of behavioral disturbances appear to occur in children with abnormal EEG's and/or organic brain damage. According to Bradley (1951) these disturbances include: erratic variability (unprecipitated, purposeless fluctuations in social adaptability occurring at longer or shorter, usually irregular intervals), and irritability (the relative ease with which one becomes impatient, angry, or aroused to aggressive, hostile, vindictive activity) (Bradley, 1951, p. 437).

Epileptic seizures of various forms have been found to manifest different behavioral aberrations. This gives further support to the contention that certain behavioral manifestations present in epileptics are of physiological rather than psychological origin. Further, these abnormalities may occur prior to an attack, during an attack or after the cessation of an attack. For example, individuals suffering from petit mal attacks, often appear apathetic, disoriented, and confused during an attack although they are mobile and able to function to the extent that medication and nourishment can be taken by mouth (Sutherland, Tait & Eadie, 1974; Livingston, 1972).

Some epileptics manifest significant changes in their personality and behavior prior to the onset of a grand mal attack, as long as 24 to 48 hours before. Some children complain and present evidence of restlessness, increased irritability, and varying stages of tension and bizarre behavior (Sutherland, Tait & Eadie, 1974). According to Livingston (1974), personality and behavioral aberrations are an integral part of the patients symptomatology and may be best classified as a prolonged psychic aura. In certain instances, the termination of the attack results in the resumption of normal personality and behaviors.

Upon recovery from the deep sleep or coma which frequently follows a grand mal seizure and almost always follows a protracted seizure, the patient usually exhibits a variety of irregular and inconsistent signs and symptoms (postconvulsive phenomena) consisting of marked restlessness, mental confusion, increased irritability, undue aggressiveness, and belligerence (Sutherland, Tait & Eadie, 1974). In this state, he/she may mumble incoherently and fumble with his/her clothing and other objects. Initially, the patient is clearly disoriented and periods of excitement sometimes appear, lasting from minutes to as long as several days. This excitement may include extreme agitation, hallucinations, and delusions that may lead to aggressive outbursts (Livingston, 1974).

During a psychomotor attack there is a distinct possibility of bizarre psychic and/or motor symptomatology, although assaultive and destructive behavior is rare (EFA, n.d.). Feelings of unreality (derealization or depersonalization), and affective disorders (e.g., episodes of anxiety, fear, depression, paranoid feelings) are also experienced by those having temporal lobe seizures. A number of researchers have found individuals with temporal lobe epilepsy manifest slow thinking, inappropriate emotions, unstable moods, suspiciousness and paranoia (Glaser & Dixon, 1956; Ray et al., 1949; Mulder & Daly, 1952; Preston & Atack, 1964; Serafelenides, 1965; Chessick & Bolin, 1962; Stevens, 1966).

Bennett (1962) reports 50% of those with temporal lobe epilepsy have serious psychological or mental disorders. However, such findings have been disputed by others, who conclude the incidence of psychosis in epileptics is about the same as in the general population.

Evidence has been presented to support the view that abnormal sexual behavior in the form of hyposexuality is associated with psychomotor epilepsy, more specifically hyposexuality is associated with temporal lobe dysfunction (Gastaut & Collomb, 1954; Blumer & Walker, 1967). In many instances it appears this sexual difficulty is related to antiepileptic medication, particularly Mysoline; in other cases, it is related to psychiatric disturbances, usually severe anxiety or depression. However, these characteristics are not unique to the adult epileptic, but are exhibited by many chronically ill patients. Schizophrenic-like psychoses lasting days or weeks have been found to occur with greater frequency in patients with temporal lobe epilepsy than in those with other forms (Sutherland, Tait & Eadie, 1974).

Behavioral and personality aberrations among epileptic patients are often noted as manifestations of the "epileptic personality". (Clark, 1917; Kanner, 1930; Temkin, 1945). Some of the more common personality traits included are: slowness of reactions, unresponsiveness to external factors, rigid emotional attitudes, and fixed opinions (Livingston, 1972). Epileptic personality studies commonly associate epilepsy with a wide variety of adverse traits, often suggesting that epileptics, both children and adults, present a wide range of abnormal and anti-social behavior, including crime (Bagley, 1971). Suter (1956) noted the following traits are often exhibited by epileptics: egocentricity, emotional poverty, supersensitivity, irritability, stubbornness, hostility, aggressiveness, paranoia, and stereotyped manners and speech. Stander (1939) noted that a typical epileptic response was explosivenss and irritability in action. While Goldkuhl (1946), Schacter & Cotte (1953), Massignon (1956), Escobar (1956), Okuma (1962), and Matalay & Pavlovkin (1972) reported epileptics displayed abnormal patterns on the Rorschach test, other studies, e.g., Mignone (1970), have indicated that epileptics respond differently to the MMPI than the general population. However, most of these studies were based upon institutionalized samples, and more recent studies conducted on non-institutionalized groups refutes the assumption of a specific, identifiable epileptic personality. Studies based upon Rorschach tests which reject the concept of an epileptic personality include: Paillas & Subirana (1950), Delay et al. (1955), Gastaut et al. (1955), Mirsky et al. (1960), Harrower-Erickson (1941), Piotrowski (in Koch & Knight, 1965). Studies based upon the MMPI which reject the concept of an epileptic personality include: Small et al. (1962), Guerrant et al. (1962), Meier & French (1965), Jordan (1963), and Klove & Doehring (1962). A thirty-year study on the medical, social and emotional progress of approximately 20,000 patients at the John Hopkins Epilepsy Clinic convinced researchers: "Epileptics as a group do not present characteristic stereotyped personality changes or behavioral disturbances, and...that a special syndrome such as 'epileptic personality' does not exist "(Livingston, 1972, p. 464). Anderson et al. (1962) reports similar findings. Since institutionalized epileptics constitute only 5 to 10% of the total epileptic population, it would appear that these studies are more accurate in their assessment of the situation. In general these studies support the view that epileptic patients, while not exhibiting a specific personality type, do manifest certain behavioral abnormalities similar to those of other chronically ill patients. Furthermore, there is general agreement that epileptic children exhibit certain types of personality disorders. These include: (1) a neurotic picture, marked by anxiety, depression, fears and inhibition; (2) aggression with temper tantrums and anti-social behavior, and (3) overactive or hyperkinetic behavior (Bagley, 1971).

These behavioral aberrations are often more severe among epileptics than among those with more socially accepted chronic illness (Livingston, 1972). It has been suggested that the frequency and severity of emotional disturbances in epileptic patients is the result of a twofold handicap: (1) the epileptic must cope with the hazards, complications and restrictions associated with his disease; and (2) he must cope with the misunderstandings and misconceptions of society relative to the disease, epilepsy (Livingston, 1972).

Although some epileptic patients develop major psychiatric disturbances, including psychotic states such as paranoia, schizophrenia and suicidal tendencies, these occurrences are no more prevalent than in the normal population, with socially dangerous reactions being rare (Sutherland, Tait & Eadie, 1974). The mental disturbances and psychotic episodes which do occur during the course of the disease often result when seizures are not controlled by treatment, or may be precipitated by drug therapy (Sutherland, Tait & Eadie, 1974). Studies have also indicated that the psychoses are chronic in some patients. The psychotic disorders include: transient episodes of uncontrolled behavior; psychotic episodes of extended duration, several days or weeks, and characterized by confusion, delusions, mental clouding and hallucinations; and prolonged psychosis, similar in character to that of schizophrenia (Merritt, 1967; Sutherland, Tait & Eadie, 1974).

It was observed that children suffering from relatively frequent seizures, but displaying essentially normal personalities and no significant behavioral problems between epileptic attacks, exhibited personality changes and behavioral aberrations when their seizures were controlled with antiepileptic medication. Although these disturbances varied among patients, most anomalies consisted of restlessness and hyperactivity, frequent temper outbursts and belligerence. However, the occurrence of another seizure resulted in the resumption of a normal behavior pattern. Researchers suggested two factors which might cause this phenomena: the antiepileptic medication and/or societal factors, such as the "overprotective syndrome", school problems, or fear and anxieties related to their disease. Fifty children exhibiting behavioral abnormalities in association with the complete cessation of seizures were observed. It was concluded that the behavioral difficulties were "clinical manifestations of cerebral dysfunctioning, and not related to societal pressures not antiepileptic medication. That is, the nature of the disease epilepsy is such that certain behavioral abnormalities are manifestations of the disease itself" (Sutherland, Tait & Eadie, 1974).

Though there is evidence that in some epileptic individuals, certain drugs and societal pressures do produce certain behavioral abnormalities, according to Livingston (1972). Behavioral aberrations and personality changes have been observed in association with the administration of all of the anticonvulsant drugs. In some instances, it could be determined that the antiepileptic agent was responsible for the emotional difficulties; in other cases, the relationship was "questionable" (Livingston, 1972, p. 474). It has been noted that phenytoin, phenobarbitone and primidone (mysoline) are all capable of producing negative side effects in epileptic patients. Neuropsychiatric symptoms (e.g., depression, dementia, schizophrenic-like psychosis, peripheral neuropathy) may occur rarely in persons taking phenytoin over a number of years. Serum folate levels are low and serum vitamin $B_{12}$ levels may be low or normal. Improvement in the patient's mental state may occur when vitamin $B_{12}$ is given with folic acid. Phenobarbitone may cause psychic manifestations of temporal lobe epilepsy, and in children the drug frequently causes irritability and restlessness. Furthermore, although primidone can be used in partial epilepsy, there is a tendency for psychotic reactions to be precipitated by the drug in patients suffering from temporal lobe epilepsy (Sutherland, Tait & Eadie, 1974).

Many epileptic patients develop anxiety states and/or depressive states due to the anticipation of having a seizure. The suddenness and unpredictability of most seizures tends to make many patients tense and apprehensive (Livingston, 1972). The fear of being out of contact for a period of time, fear of injury or death as a result of a seizure, and/or the fear of having their disorder exposed to the public often results in behavioral problems.

Repeated seizures with comcomitant loss of contact with the environment cause some epileptics to become frustrated and bitter. Cognizant of the adverse social implications associated with this disorder, many adult patients adhere to a strict secrecy policy regarding their condition. Some develop marked antisocial tendencies, with reluctance to expose their disability to their employer. Some epileptics develop feelings of inferiority and paranoid thought patterns due to anxieties regarding marriage, pregnancy (the possible development of epilepsy in their offspring) and by the possible loss of employment and difficulty in obtaining employment (Sutherland, Tait & Eadie, 1974).

Horowitz (1970) believes that the lack of control over the occurrence of seizures may make the epileptic child passive and dependent. Social dependence in turn can lead to a loss of self-concept, frustration, shame, aggression, depression and guilt.

Most emotional disturbances of the epilepsies are due to: (1) fears and anxieties associated with anticipation of a seizure; (2) public stigma; (3) mismanagement of patients at home or in the community, and (4) idiosyncracy, overdosage of adverse reaction to antiepileptic drugs (Lennox, 1944; Bridge, 1949; Livingston, 1963).

## TABLE 1-15
## LIFE FUNCTION TABLE - EPILEPSY: SOCIAL-ATTITUDINAL

| Statement of Problem | Dynamics | Source |
|---|---|---|
| Neuroses - based on lack of security & concomitant feelings of antagonism, resentment & inferiority | Due to pampering, overprotective parents | Livingston, 1972 |
| Psychosocial disturbance - (FEAR) due to insecurity resulting from anticipation of experiencing a seizure & its accompanying social implications | Stem from fear of being out of contact for a period of time, fear of injury or death, fear of having disorder exposed to general public | Livingston, 1972 |
| Irritability | Due to feelings of drowiness & dullness caused by medications | Livingston, 1972 |
| Marked restlessness mental confusion increased irritability undue aggressiveness belligerence | Postconvulsive phenomena (postictal phase) of major (grand mal) seizures lasts from minutes to several days | Livingston, 1972 |
| Increased restlessness, increased irritability, general states of tension, bizarre behavior | For periods as long as 24-48 hours prior to onset of major motor (grand mal) seizures | Livingston, 1972 |
| Confusion, disorientation | Petit mal status (continuous petit mal spell(s)) | Livingston, 1972 |
| Restlessness<br>Hyperactivity<br>Frequent temper outbursts<br>Belligerence | Occur when seizures were controlled with antiepileptic medication; clinical manifestations of the cerebral dysfunction which is the basis of frank epileptic siezures per se | Livingston, 1972 |

## TABLE 1-15 (CONT'D)
## LIFE FUNCTION TABLE - EPILEPSY: SOCIAL-ATTITUDINAL

| Statement of Problem | Dynamics | Source |
|---|---|---|
| Antisocial tendencies; feeling of inferiority & being 'different'; anxiety; undue antagonism; belligerence | Due to restrictions in coping with complications of epilepsy & misunderstandings of society about epilepsy | Livingston, 1972 |
| Epigastric sensation - somatic hallucination, a peculiar, usually unpleasnat sensation - often described as a fear, commencing in the epigastrium & rising to the chest & throat | One of commonest symptoms of temporal lobe type of partial epilepsy | Sutherland, et. al., 1974 |
| Dreamy states - feelings of unreality (derealization or depersonalization) | Symptom temporal lobe epilepsy | Sutherland, et. al., 1974 |
| Affective disorders - episodes of anxiety, fear, ecstasy, depression, paranoid feelings or mixture of these | Symptom of temporal lobe epilepsy | Sutherland, et. al., 1974 |
| Tenseness | For several hours or days before grand mal seizure | Sutherland, et. al., 1974 |
| Confusion | After grand mal seizure | Sutherland, et. al., 1974 |
| Abnormal sexual behavior - hyposexuality | Psychomotor (temporal lobe) epilepsy; frequently normalized following loectomy | Gestaut & Collomb, 1954; Blumer & Walker, 1967 |
| Apathy, confusion | Symptoms of benign petit mal status | Sutherland, et. al., 1974 |
| Psychotic reactions | Side effect of primidone (Mysoline) in pts suffering from temporal lobe epilepsy | Sutherland, et. al., 1974 |

## TABLE 1-15 (CONT'D)
## LIFE FUNCTION TABLE - EPILEPSY: SOCIAL-ATTITUDINAL

| Statement of Problem | Dynamics | Source |
|---|---|---|
| Restlessness | Side effect of Phenbarbitone in children | Sutherland, et. al., 1974 |
| Psychic manifestations | Aggravated in temporal lobe epileptics using phenobarbitone | Sutherland, et. al., 1974 |
| Neuropsychiatric symptoms - depression, dementia, schizophrenic - like psychoses, peripheral neuropathy | May occur rarely in persons taking phenytoin over number of years; $B_{12}$ & folic acid may improve condition | Sutherland, et. al., 1974 |
| Feelings of inferiority | Often brought on by anxiety regarding marriage, pregnancy & development of epilepsy in their children & by loss of employment & difficulty in obtaining employment | Sutherland, et. al., 1974 |
| Serious psychological or mental disorders | in 50% of temporal lobe epileptics (17% of all epilepsy is temporal lobe epileptic) | Bennett, 1902 |
| Fearfulness | Psychomotor epilepsy | Serafitinides, 1970 |
| Suspiciousness<br>Blaming others attitude | Idiopathic grand mal epilepsy; trend greater disturbances than in psychomotor | Guerrant, et. al., 1962 |
| Outbursts of catastrophic rage | Exhibited by 36 of 100 children with temporal lobe epilepsy; strongly related to early onset (not related to frequency) disordered homes may contribute | Ounstead, 1969;<br>Hill, et. al., 1952 |

### TABLE 1-15 (CONT'D)
### LIFE FUNCTION TABLE - EPILEPSY: SOCIAL-ATTITUDINAL

| Statement of Problem | Dynamics | Source |
|---|---|---|
| Interictal | Commonest interictal behavioral; commonest ictal emotion | Serafetinides, 1960 |
| Interictal | Interictal state occurs more often than chance expectation | Davidson & Bagley, 1969 |
| Personality disorders; hysteria anxiety | Temporal lobe epileptics | Falconer & Serafetinides, 1963 |
| Inappropriate emotions; unstable moods; suspiciousness; paranoia | Temporal lobe epileptic | Gastaut, et. al., 1955; Glaser & Dixon, 1956; Ray, et. al., 1949; Mulder & Daly, 1952; Hill, et. al., 1957; Preston & Ataek, 1964; Stevens, 1966; Serafetinides, 1965; Chessick & Bolin, 1962 |
| Episodic behavioral disorders or maladaptive behavior periodically interrupts usual flow of the person | Episodes are motivated by rage, fear or sensual feelings & result in relief of tension. These people do not have classic epilepsy but have periodic storms of an decrease nature in the brain | Monroe, 1972 |
| Violent behavior | Carried out only 1-2% of all epileptic seizure result in violence - usually seems to originate in temporal lobe | Delgado, 1971 |
| Severe personality disorders-attempted suicide | Psychomotor epilepsy | |

### TABLE 1-15 (CONT'D)
### LIFE FUNCTION TABLE - EPILEPSY: SOCIAL-ATTITUDINAL

| Statement of Problem | Dynamics | Source |
|---|---|---|
| Psychotic | | Gibbs, Gibbs & Fuster, 1948; Hill, et. al., 1952; Davidson & Bagley, 1969; Stamps, 1962; Falconer & Serafetinides, 1963 |
| "Epileptic personality" egocentricity, emotional poverty supersensitivity, stubborness hostility, stereotyped manners & speech | | Suter, 1956; Rey, Pond & Evans, 1949 |
| Apprehensiveness | Precipitated by mothers who have strong, hostile feelings for epileptic children but compensate by overprotectiveness "compensatory cuddling" & anxiety | Rey, Pond & Evans, 1949; Navrakil & Stritzka, 1954 |
| Abnormal patterns on Rorschaech | | Goldkuhl, 1946; Schacter & Cott, 1952; Massignon, 1956; Esceobar, 1956; Okuma, 1962; Matalay & Pavlovkin, 1927 |
| Erratic, variable in mood & overt behavior - apparently unprecipitated, purposeless fluctuations in social adaptility occurring at longer or shorter, usually irregular intervals. Irritability--relative ease with which one becomes impatient, angry or aroused to aggressive, hostile, vindictive activity | Found in children who have abnormal EEG's and/or organic brain damage | Bradley, 1951; |

### TABLE 1-15 (CONT'D)
### LIFE FUNCTION TABLE - EPILEPSY: SOCIAL-ATTITUDINAL

| Statement of Problem | Dynamics | Source |
|---|---|---|
| Physical, aggressiveness= unprovoked, in the ordinary sense acts of explicit physical aggression | Most common in young boys with early onset of epilepsy & a left (dominant) temporal lobe focus | Serafetinides, 1965 |
| Depression | More common in late onset of epilepsy | Horowitz, 1970; Serafetinides, 1965; Falconer & Serafetinides, 1963 |
| Overactive or misbehave in school & other settings | Especially epileptic children who have suffered brain damage or experience psychomotor seizures | Lennox & Lennox, 1960 |
| Fear of rejection or disclosure | Results in epileptics not applying to colleges, certain employment opportunities | Lennox & Lennox, 1960 |
| Constant fear of discharge from work, etc. | Of 375 adult epiletics 45% did not report condition to employer | Lennox & Markhan, 1953 |
| Discouragement, feelings of inferiority, resentment | May be the result of social isolation & hence reversible | Lennox & Lennox, 1960; Horowitz, 1970 |
| Secrecy about having epilepsy may extend to unwillingness to seek medical advice or to purchase prescribed anticonvulsants in home town | | Lennox, 1960 |
| Weakened self-evaluation precipitated increased defensive operations ultimately leads to feelings of difference | Precipitated by others' evaluations of him | Horowitz, 1970 |
| Passive & Depending | Due to fact that he has no control over seizures | Horowitz, 1970 |
| Loss of self concept frustration shame | Precipitated by social dependence | Horowitz, 1970 |

TABLE 1-15 (CONT'D)
LIFE FUNCTION TABLE - EPILEPSY: SOCIAL-ATTITUDINAL

| Statement of Problem | Dynamics | Source |
|---|---|---|
| Episodic epileptic | There probably exists a separate group of episodic epileptic psychoses which are psychologically similar but related to changes in medication and/or the suppression of EEG epileptiform activity | Davidson & Bagley, 1967 |
| Crime - epilepsy overrepresented by 5X normal prevalence (assumes - 5% prevalence rate) | 1,154 male prisoners Lewisburg Federal Penitentiary, Pa | Ruth & Erwin, 1971 |
| Confusional states | Lasting usually hours occuring in some point with generalized epilepsy. May occur following a seizure or be associated with a period of considerably disturbed EEG activity in the absence of overt seizures | Sutherland, et. al., 1974 |
| Schizophrenic - like psychoses - grossly disturbed behavior with paranoid thinking, hallucinations & serious homicidal or suicidal actions | Lasting days or weeks occur with greater frequency in points with temporal lobe epilepsy than in those with other forms. May be chronic in some patients; may be precipitated by drugs in others | Sutherland, et. al., 1974 |

Communication. Table 16 lists the problems an epileptic may encounter in communicating. While Suter (1956) reports on the epileptic's stereotyped speech, most deficits in the area of communication are attributable to the side effects of drugs or the seizures themselves. Hallucinations, for example, are a common symptom of the pre-seizure aura, and staring spells are integral characteristics of the petit mal seizure.

## TABLE 1-16
## LIFE FUNCTION TABLE - EPILEPSY: COMMUNICATION

| Statement of Problem | Dynamics | Source |
|---|---|---|
| Stereotyped speech | | Suter, 1956 |
| Diplopia - perception of 2 images of a single object | Side effect of Primidone (Mysoline); may occur during last few days of treatment | Sutherland, et al., 1974 |
| Hallucinations - may effect a smell, taste, hearing, vision & movement. Sometimes the visual disturbance is an illusion - objects appearing small, distant or distorted | Temporal lobe type of partial epilepsy | Sutherland, et al., 1974 |
| Staring spells | Petit mal epilepsy | Livingston, 1972 |
| Incoherent mumbling speech disturbance | Postconvulsive phenomena of major motor (gran - mal) seizures lasts from minutes to several days | Livingston, 1972 |

Cognitive-Intellectual. A number of factors have been linked to impairments in intelligence and mental ability among epileptic individuals: (1) age of onset; (2) medication; (3) brain damage, either congenital or due to inuury; and (4) frequency and severity of seizures (EFA, 1975).

According to Rodin et al. (1972), the earlier the onset of epilepsy, the greater the impairment in intelligence. Early onset of epilepsy involves complications of interuppted education and possible psychological problems.

Travers (1971) reported that the longer the duration of anticonvulsant therapy, the greater the evidence of psychomotor slowing, intellectual deterioration, and personality change. However, the majority of studies note that the extent of the deterioration is neigher significant nor rapid (EFA, 1975).

In most cases, people with epilepsy have the same general range of intelligence as the non-epileptic population (EFA, 1973). In epileptic individuals with mental disorders, or mental deterioration, the effects of other underlying causes should be considered. Certain progressive brain diseases produce both seizures and intellectual deterioration. However, not all patients with seizures will suffer such impairments (EFA, 1974b). Approximately 80% of the children developing seizures after infancy are intellectually normal (Sutherland, Tait & Eadie, 1972).

Although convulsions alone rarely cuase mental deterioriation or mental disorders, the underlying condition causing the seizures may produce these results (EFA, 1966). A brain injury or disorder of the cental nervous system which caused epilepsy may also cause other conditions, e.g., mental retardation or cerebral palsy (EFA, 1973). Epileptics with demonstrable organic pathology, brain injury, or major seizures tend to have a lower IQ than those with minor seizures or epilepsy of unknown origin (etiology) (Angers & Dennerll, 1962). Sometimes uncontrolled seizures during childhood may have an effect on mental capacity, for those whose epilepsy is of later onset (e.g., adults) generally have higher IQs than epileptic children (EFA, 1973; Angers & Dennerll, 1962). Among epileptics, the percentage of retardates is disproportionately higher than in the nonepileptic population; and usually epileptics who are mentally retarded suffer from some form of brain damage as well (Boshes & Gibbs, 1972). According to Boshes & Gibbs (1972) the percentage of retardates is 3 to 4 times higher than in the general population; while according to the EFA: "The average rate of mental retardation is 5.9% for patients with epilepsy as compared to the national mental retardation prevalence rate of 3% (EFA, 1975).

There is considerable controversy regarding the subject of mental retardation in patients with convulsive disorders. In a study of over 2,000 epileptic patients seen in clinics or private practice, 67% were mentally normal, 23% slightly deteriorated and only 10% definitely deteriorated. Mental deterioration was more common in patients whose seizures were associated with organic lesions of the brain, being more frequent in patients in whom damage to the brain occurred in the first year of life (Lennox, 1951). Infants having infantile spasms usually are or later become mentally subnormal. Status epileptus may lead to cerebral atrophy and cause anoxic brain damage (Sutherland, Tait & Eadie, 1974). It was also more common in patients with no known lesion in the brain, although seizures in the latter group were more frequent and had occurred for many more years (Lennox, 1951).

In the same study it was concluded that the mental level of the patients without organic lesions in the brain was related to the mental level in the first few years of life, the frequency and type of seizures and the duration of the periods during which the patient had been subject to attacks. Seventy-five percent of the patients who were mentally normal in infancy were normal at the time of examination. Mental deterioration, when present, was commonly associated with the occurrence of frequent seizures over a period of many years. Psychomotor seizures, grand mal and petit mal attacks appeared to be harmful in regard to the development of normal learning ability. Petit mal attacks have been found to be related to impaired concentration and deteriorating scholastic performance (Sutherland, Tait & Eadie, 1974). Temporal lobe seizures produce memory disturbances: deja vu (undue senses of familiarity with unfamiliar environment); jamais vu (feeling of unfamiliarity with known environment); time disorientation (sensation of time standing still or rushing past), as in panoramic memory; and forced recall of scenes, words or phrases (Sutherland, Tait & Eadie, 1974). Furthermore, Bradley (1951) reports that epileptic children exhibit short and vacillating attention spans, hypermobility and a rather selective difficulty in mathematics as a school subject. It should be noted that certain sociopsychological mediating variables megatively effect school performance, e.g., attitudes of teachers, classmates, as well as poor attendance records due to epileptic attacks (EFA, 1966; EFA, 1975).

Studies dealing with the interaction among epileptic seizures, intelligence and learning ability offer conflicting and often contradictory evidence. Thus, at this point in time, the exact nature and extent of the relationship is not fully understood. The studies cited below, while offering some insight into the subject, reflect this dilemma. Coelho and Marques (1970) studied the intellectual achievement of 62 epileptic adolescents and found that while 50% had poor academic achievement, this did not correlate with the type, duration, or frequency of seizures. Green and Hartladge (1971) compared the academic, communicative, and social skills of 50 epileptic children and 50 non-epileptic children and found that epileptic children scored below the expected level. However, they found lower parental expectations to be the main causal factor, rather than innate intelligence.

Scott, Moffett, Matthews, and Ettlinger (1969) conducted a study of the effects of epileptic discharges on learning and memory. No significant differences between the experimental group of 24 epileptic patients and the control group of 16 non-epileptic subjects on several tests were reported. These findings contradict the findings of Duetsch (1953) who found no difference between focal and non-focal epileptics but did find epileptics to be different from the normal controls. Mirsky et al. (1960) found the epileptic subjects to be different on attention but not on memory tasks.

## TABLE 1-17
## LIFE FUNTION TABLE - EPILEPTSY: COGNITIVE-INTELLECTUAL

| Statement of Problem | Dynamics | Source |
|---|---|---|
| Perseveration<br>Poverty of content in thinking retardation<br>Cerebellar disturbance - a syndrome of cerebellal dysfunction appears to be related to plasma concentration of phenytoin | Rorschach test (noted that these responses were also common of "normal" people on large dosages of phenobarbital) | Staunder, 1938 |
| Cerebebral atrophy & dementia | Pt recovering from status evoilecticure may dev. hypoxic neural damage leading to cerebral atrophy | Sutherland, et al., 1974 |
| Mental confusion | Side effect of sulthiome (Ospobt) | |
| Poor academic achievement | 50% of 62 epileptic adolescents-not relative to types duration & frequency of seizures | Coelho & Marques, 1970 |
| Low academic, communitive & social skills | 50 epileptic children scored below expected level as compared to 50 non-epileptic. Relative to lower parental expectation rather than innate | Green & Hartladge, 1971 |
| Learning & memory deficit | When compared to a group of normal controls | Deatch, 1953 |
| Attention deficit | Inferior to normal on attention tasks | Mirsky, et al., 1960 |
| Impaired attention | Symptom of benign petit mal status | Mirsky, et al., 1960 |

TABLE 1-17 (CONT'D)
LIFE FUNCTION TABLE - EPILEPSY: COGNITIVE-INTELLECTUAL

| Statement of Problem | Dynamics | Source |
|---|---|---|
| Mentally subnormal | Infants having infantile spasm may manifest later mentally subnormal | Sutherland, et al., |
| Mental retardation | of 5600 patients with pure grand mal 5.7% were mentally retarded; of a similar number of patients with petit mal 6% were mentally retarded; of 3000 patients with psychomoter epilepsy 6% were mentally retarded; average rate of mental retardation | Stamps, et al., 1962 |
| Disturbance in memory-(undue sense of familiarity with unfamiliar environment) Jamais vu (feeling of unfamiliarity with known environment), a sensation of time standing still or rushing past, as in panoramic memory may be experienced. Sometimes there is forced recall of scenes, words or phrases | | Sutherland, et al., |
| Mental deterioration or mental disorders | Usually not caused by convulsions alone, but by underlying condition-causes of seizures | Sutherland, et al., |
| Learning problems | Petit mal seizures may result in less problems as a result of on-off contact with his environment - at home school or work | Sutherland, et al., 1974 |
| Poor reading & arithmetic abilities | Reading-age retardation is more associated with psychiatic disorders than with epilepsy while arithmetic-age retardation is more associated with epilepsy than psychiatic disorders | Bagley, 1960) |

## TABLE 1-17 (CONT'D)
## LIFE FUNCTION TABLE - EPILEPSY: COGNITIVE-INTELLECTUAL

| Statement of Problem | Dynamics | Source |
|---|---|---|
| Complete amnesia | Postconvulsive period of major motor attack; may last from minutes to several days | Livingston, 1972 |
| Mental shortcomings & in some cases progressive deterioration ending in extreme dementia | Certain groups of epileptics - notably institutionalized cases | Keating, 1960 |
| Intellectual deterioration | Compared 28 epilepsy children with intell. deterioration with 28 epileptic children without increase of incidence of brain damage related to the number of seizures, poorer response to medication & more generalized abnormalities, & focal signs, on the EEG (not related to site & extent of brain damage, age of onset of epilepsy, amount & duration of anticonvulsants & associated emotional & behavior problems) | Chaundry & Pona, 1961 |
| More 'retarded' than 'dull-normal' or 'average' | 296 epileptic children Stanford-Binet test of intelligence | Keith, 1963 |
| Low intelligence | Related to age of onset of epilepsy & in 73% of children whom epilepsy was symptomatic of organic brain damage; Studied 100 children with temporal lobe epilepsy-related to frequency of temporal lobe attacks & significantly related to status epileptics accuracy early in child's life | Keith, 1963; Ounster, et al., 1963 |

## TABLE 1-17 (CONT'D)
## LIFE FUNCTION TABLE - EPILEPSY: COGNITIVE-INTELLECTUAL

| Statement of Problem | Dynamics | Source |
|---|---|---|
| Short and vacillating attention span - inability to concentrate | Epileptic children | Bradley, 1947, 1951 |
| Difficulty in mathematics as a school subject | Epileptic children | Bradley, 1947, 1951 |
| Low IQ - average IQ in professional matrices test was 94 - wignificantly below normal population score | 161 children & young adults attending the National Hospital; epileptic children took significantly longer time to finish test | Davies & Eysenck, 1952 |
| Low performance score | Epileptics with generalized abnormalities on the EEG had self scores which were significantly lower than verbal; not true for psychomotor epileptics | Parsons & Kemp, 1960 |
| Learning handicap | Associated with a diffuse, synchronous spike wave & slow wave EEG adolescent & adults | Milstein & Stevens 1961 |
| Short-retrogade amnesia | Observed in association with petit mal seizures in children; flickering light & discharges affected (amnesia paroxyscol) EEG discharges memory for recall of digits in 2 of 4 epileptic children | Hutt, et. al., 1963 |
| Depression of concentration & learning ability | Association with discharges of long duration & discharges clearly of a 'clinical' type - as opposed to short or 'subclinical' bursts in 36 epileptics where organic factors were not suspected | Davidoff & Johnson, 1964 |

### TABLE 1-17 (CONT'D)
### LIFE FUNCTION TABLE - EPILEPSY: COGNITIVE-INTELLECTUAL

| Statement of Problem | Dynamics | Source |
|---|---|---|
| IQ results may be related to drugs | 25 children with petit mal epilepsy who had been treated with anticonvulsant drug ethosuximeol (Zarontin) showed significant decrease on WISC testing score after administered & tried; in 60% of cases a lowered score in Bender's visual retention test was noted | Guey, et al., 1967 |
| Intellectual behavior impaired by anticonvulsants such as zarontin | Occurs in some cases if given strong doses | Guey, et al., 1967 |
| Intellectual defects caused by cerebral lesions | In 40 children administered to the National Hospital with cerebral lesions beginning after the age of one, greatest impairments in children with parietal lobe tumors (mean IQ 77.8) and least in children with temporal lobe tumors (mean 90.1) | McFie, 1961 |
| Overall intelligence well below average | 25 brain damaged children (13 of whom were epileptic) | Ingram, 1956 |
| Short attention span, distractability; wide scatter on IQ subjects | 70 epileptic children who were hyperkinetic; range of IQ from idiotic - high normal | Ounster, 1955 |
| Lower IQ in hyperkinetic cases | 100 children with temporal lobe epilepsy; 26 hyperkinetic cases had a significartly lower IQ than non-hyperkinetic cases; only 2 of hyperkinetic cases had an IQ above median score (90) | Ounster, et al., 1963 |

TABLE 1-17 (CONT'D)
LIFE FUNCTION TABLE - EPILEPSY: COGNITIVE-INTELLECTUAL

| Statement of Problem | Dynamics | Source |
|---|---|---|
| Impaired memory of actions | Found during post-ictal state, especially by epileptic children who are aggressive & anxious | Blumer & Walker, 1967; Bagley, 1971 |
| Reading retardation | Behaviorally normal epileptic children have significantly less reading retardation than mixed, agressive & anxious children, the latter group have the greatest amount of retardation in reading age (measured by discrepancy Schnell Reed, Test & Verbal Mental Age from WISC) | Boshes & Gibbs, 1972 |
| Arithmetic retardation | Retardation of performance is particularly marked in epileptic children. Aggressive epileptics have highest amount with an average of a 2½ year discrepancy between mental age and arithmetic age. Anxious epileptic children have significantly less arithmetic retardation than normal, mixed or agressive epileptics | Boshes & Gibbs, 1972 |

## VI. Functioning as a Member of Society

The literature provides information about the epileptic's functions in the labor force and the community.

## Functioning as a Member of the Labor Force

The exact number of epileptics gainfully employed is unavailable at this point in time. Figures vary from .1% of the working population (Udel, 1960) to approximately 2% of the working population (EFA, 1975). The latter figure is just an estimate. It is arrived at by applying a 2% prevalence figure for the number of epileptics in the general 15 and over population to the 1972 labor force figures. Thus the EFA concluded that since 2% of the general 15 and over population are epileptics, 2% (approximately 1,7000,000) of the total labor force are epileptics. (See Table 18).

This is not necessarily a logical assumption, since the National Epilepsy League (1955) reports only 80% of those with epilepsy can be gainfully employed. This is due to the following: it is estimated that medication will allow only 50% of those with epilepsy to have complete seizure control and another 30% to have only occasional seizures. This 80% figure is verified by Karan (1972) who notes that by utilization of proper medication, 75-85% of those with epilepsy can lead normal lives.

In a recent survey conducted by the Epilepsy Foundation of America, it was found that the greatest sociopsychologic problem facing the epileptic continues to be employment. According to EFA (n.d.) approximately 42% of the epileptic patients surveyed reported problems attributable to epilepsy in getting a job, while 33.8% indicated the disability resulted in difficulties in remaining on the job. The U.S. Dept. of Labor (Bulletin No. 923, EFA, 1975) reports that "...on the basis of exclusion policies and number of impaired persons employed, of the impairments studied, epilepsy was found to be the handicap most difficult to overcome in obtaining employment."

## TABLE 1-18

## ANALYSIS OF LABOR POPULATION WITH EPILEPSY[3]

| Age Group | 1970 Population[1] (in thousands) | Estimated No. of Pop. with Epilepsy (2%) | Per Cent Pop. in Labor Force[2] | Labor Force with Epilepsy |
|---|---|---|---|---|
| 15-19 | 19,285 | 385,700 | 50.0 | 192,850 |
| 20-24 | 17,176 | 343,520 | 70.4 | 240,394 |
| 25-34 | 25,278 | 505,560 | 70.3 | 353,892 |
| 35-44 | 23,088 | 461,760 | 73.4 | 337,085 |
| 45-54 | 23,222 | 464,440 | 73.2 | 379,041 |
| 55-64 | 18,590 | 371,800 | 61.6 | 230,516 |
| over 65 | 12,435 | 248,700 | 16.8 | 59,279 |
| | | | TOTAL | 1,793,057 |

Source: [1] Statistical Abstract of the United States, 1972, p. 31.
[2] Ibid., p. 217, average of male and female.
[3] (EFA, 1975).

According to Wagner & Knelz (1971), 80-90% of children with epilepsy can attend regular school if they receive the proper medication. However, other studies tend to contradict these findings. For example, Gregiriades (1972) reports that 15% of his sample of children with epilepsy were classified as uneducable; 30% required special education classes and the remainder (65%) were educable in regular schools.

It has been found that the scholastic performance of a child with epilepsy is partially dependent upon the attitudes of his/her teachers (Kram, 1963). A positive attitude toward the epileptic child is often influenced by the teacher's knowledge of epilepsy. In a survey of 710 teachers, Force (1965) found that over one-half had no experience with or information about, seizures. Furthermore, only 44.5% of those individuals receiving instructions on how to handle seizures, felt they could handle the situation. In a comparison of regular classroom teachers and special education teachers, it was found that special education teachers were more experienced than regular teachers in dealing with epileptic seizures.

In terms of academic performance, teachers often equate the child's current performance with his basic intelligence, without being aware of the problem of under-functioning caused by epilepsy (Bagley, 1970). This attitude leads to the self-fulfilling prophecy in the student's performance. The unawareness of unique needs extends to school counselors. Twenty to twenty-five per cent of school counselors lacked awareness of the social and vocational needs of epileptic students in Martin's survey (1972) and 75% of the counselors were of helping agencies for children with epilepsy.

A study of employers in six states (Colorado, Florida, Illinois, Louisiana, Missouri and Virginia) conducted by the U.S. Dept. of Labor, Bureau of Labor Standards (1960) indicated that employers discriminate against those with epilepsy to a greater extent than other disabilities. The question was asked as to the willingness of employers to hire persons with specified handicaps. The responses were as follows:

| Handicap | Willingness to Hire (in %) |
|---|---|
| loss of limb or eye | 35.6 |
| heart or circulatory ailment | 23.6 |
| back ailment | 17.0 |
| other orthopedic ailment | 21.7 |
| dust disease or lung ailment | 15.1 |
| EPILEPSY | 8.9 |

Ten years after the enactment of the Encouragement of Employment of the Handicapped Law in Ohio, it was found that:

> "...while a high percentage of employers had changed their policy as a result of this statute, the percentage changing their policy to one of hiring the handicapped including epileptics was only one half that of employers changing their policy to one of hiring the handicapped excluding epileptics."

(Livingston, 1972).

Although employers are beginning to change their hiring practices regarding employment of the handicapped, the attitudes toward the epileptic remain the same--he/she is unemployable.

According to a survey conducted by EFA (1973), although 40% reported their employers reacted in a positive and cooperative fashion when a seizure occurred at work, 25% of the employers were responsible for terminating, forcing to retire, or refusing advancement to the employee with epilepsy.

Almost half of the co-workers reacted favorably (in varying degrees) to seizures as compared to one-third who registered fright, shock or panic. Other data pertaining to employment of epileptics revealed the following:

46%: turned down a job because of epilepsy
30%: dismissed from a job because of seizures
45%: believed epilepsy influenced their occupational choice
35%: felt needed help in obtaining employment due to epilepsy
(EFA, 1975)

Collins (in EFA, 1975) interviewed a number of adults suffering from epilepsy. While a large number of these individuals had been employed in the past, 83%, only 49% were currently employed. A majority of these individuals, 52%, had had difficulty obtaining employment, for a number of reasons:

24%: lack of skills
21%: lack of education
30%: negative attitudes of employers
67%: health reasons
6%: miscellaneous reasons

In addition to having trouble obtaining employment, 30% also had trouble remaining on the job, for a variety of reasons:

74%: health problems
32%: negative attitudes of coworkers
32%: stress on the job
32%: other problems

Wolfson (1962) sampled 500 Arizona companies and found that of the 311 (63%) who responded, 54 (17%) employed people with epilepsy. Seventy-three percent stated they would not knowingly hire a person with epilepsy. Of these, 25% would discharge the employee as soon as his epilepsy was known and another 22% would discharge him if he had a seizure at work. The main reasons given for not hiring a person with epilepsy were: fear of accidental injury to himself (58%) or others (23%) and the belief that he would take excessive time off from work (4%).

Of a sample of 160 patients (Coward study reported by Sutherland, Tait & Edie, 1972) 20% were labeled as invalid pensioners, unable to seek, obtain or keep a job. Of the 76 employable individuals, 38% had a history of being refused employment when the nature of their disability was known. A number of employed individuals concealed the condition from their employers (59%), while 32% had disclosed their diagnosis without any negative consequences, e.g., they were not fired. Finally, 44% believed that their careers had been compromised to a significant degree due to their illness.

Netter (1968) surveyed ten industries to determine the percentage of people with epilepsy employed in each. Three of the industries with the highest per cent of employees with epilepsy are banking institutions, hospitals or clinics, and wholesale sales. The poorest opportunities for employment exist in government and private utilities. The U.S. Civil Service Commission (1973) reported placing only 35 Federal employees with epilepsy from a total of 1823 severely handicapped employees (2%) over a five-year period. It should be noted however that the Federal government, the nation's largest employer, had adopted a policy of hiring epileptics under certain conditions: if their attacks are adequately controlled and if their placement is selective.

> "The Federal Government employs epileptics in a wide variety of occupations throughtout the nation. This is accomplished through selective placement which insures that employees with epilepsy will not be exposed to any undue hazards in their work environment which would be detrimental to their safety and welfare.
>
> The U.S. civil service medical program provides the following guides to employment of all epileptics in the Federal services. Those requiring medication to control their seizures are restricted to nonhazardous occupations in which any epileptiform reaction would in no way endanger the life or health of the employee or other subjected to the same work environment. Thus, such employees are not assigned to such occupations which would involve operation of motor vehicles or other dangerous equipment, climbing and working from ladders, scaffolds or from heights which would not provide complete protection to the employee should an epileptiform attack occur. Epileptics requiring medication for control are therefore not employed in positions such as firefighter, law enforcement officer, motor vehicle operator, air traffic controller who polices the airways, regular policeman, guard, electrician, ship-yard rigger or any other position involving undue hazards.
>
> Epileptics who have become entirely free of seizures and all other epileptiform reactions are employable in some hazardous types of positions including operation of motor vehicles.
>
> No restrictions are placed upon any employee with epilepsy because of the arduous nature of the duties involved when there is no undue hazard to the employee.
>
> The basic concept for all Federal employment is that each employee shall be medically qualified to perform the full duties of his position efficiently and without hazard to himself and others."

(Statement submitted by Richard H. Meredith, M.D., Deputy Medical Director, U.S. Civil Service Commission, Feb. 12, 1970).

From the results of the above surveys, it is quite evident that information on, and help in, obtaining and keeping a job is needed for many individuals with epilepsy. Although many do have jobs, they frequently encounter negative attitudes from employers and/or co-workers. Some "normal" individuals tend to equate epilepsy with mental disorders, and therefore regard epileptics as being substandard employees (Sutherland, Tait & Eadie, 1972).

The main factors involved in not hiring epileptics include: (1) personal apprehension on the part of the employer; (2) resistance and prejudice from co-workers; (3) discriminatory workmen's compensation laws and company policies; (4) lack of proper training, counselling and placement of employable people with epilepsy; and (5) social maladjustment of the epileptic (EFA, 1974; Schlesinger, 1966).

Numerous studies have been conducted which lend support to the contention that individuals with epilepsy, as well as other handicapping conditions, work as efficiently and effectively as "normal" workers. Epileptics do not exhibit reduced work effectiveness, higher rates of absenteeism, nor higher accident rates (EFA, 1975).

Individuals with epilepsy are not only discriminated against in employment hiring practices, but have difficulty remaining on the job and have high rates of unemployment. Table 1-19 lisys unemployment figures from a number of studies conducted over a 30 year period. When compared with the unemployment rate for the total disabled population, these figures are still exceedingly high. For example, Social Security (1972) reported a 7.4% unemployment rate for the disabled in 1966 (EFA, 1975). Persons with epilepsy had a 15-25% unemployment rate for the same time period (See Dennerll et al., 1966, in Table 1-19).

TABLE 1-19

SOME ESTIMATES OF RATE OF UNEMPLOYMENT AMONG EPILEPTICS IN THE LABOR FORCE

| Source | Rate of Unemployment | Comparable U.S. Rate of Unemployment |
|---|---|---|
| Lennox (1942) | 25% | 4.7% |
| Mulder (1958) | 12.7% | 6.8% |
| Dennerll et al. (1966) | 5-25% | 3.7% |
| Porter (1968) | 14% | 4.0% |
| Karan (1972) | 2-21% | 5.6% |

Source: EFA, 1975

Lennox and Markhan (1953) sent inquiries to 375 adult epileptic patients on their employment situation. Twenty-one percent of the 375 respondents were college graduates. When housewives and students, not specifically employed, were excluded, it was found that 80% (112 persons) of the remaining 140 persons were employed. Nineteen of these employed individuals were in "protected positions"--employed by relatives or themselves. For the 28 of the 140 who were unemployed, epilepsy was listed as the main reason in 15 cases (54%). Thus, of a total of 140 epileptic individuals, only 11% were unemployed due to epileptic seizures. The reason for this low figure could be due to the educational attainment of those interviewed and the exclusion of housewives and students.

In the past, jobs in which the lives of others might be endangered if a seizure, especially grand mal or psychomotor, occurred, have been closed to individuals with epilepsy, e.g., operators of mass transit and private vehicles; surgeon; private duty nurse, swimming instructor; machine operator, steelworker (Sutherland, Tait & Eadie, 1972; EFA, 1975).

However, even the supposedly "closed" occupations have some epileptics employed in them. This may be due to: (1) the occurrence of epilepsy after the individual is employed in the occupation; (2) the type of epileptic attack--those having only noctural seizures should not have any limitations on job opportunities; (3) not informing the employer the individual is epileptic.

For example, although it is not recommended that an epileptic pursue certain medical careers, a number do so. Lennox (1960) interviewed 48 doctors who were epileptics. The specializations these doctors pursued are listed below:

| | Specialization | Specialized in Epilepsy |
|---|---|---|
| 14: | internal medicine | 2 of the 14 |
| 9: | surgery | |
| 4: | pediatrics | 2 of the 4 |
| 4: | psychiatry | |
| 3: | general practice | |
| 2: | roentgenology | |
| 2: | anaesthesiology | |
| 2: | laboratory technology | |
| 2: | gynecology | |
| 2: | neurology | 2 |

It should be noted that 9 doctors were surgeons, an occupation specifically not recommended for epileptic individuals (Livingston, 1972).

In conclusion, the majority of epileptics can lead normal lives which includes full employment and are capable of holding professional, white collar and blue collar jobs. The immediate obstacle to full employment which must be overcome is employer and co-worker attitudes. Thus, there is a definite need for additional dissemination of information to the general population on the nature and ramifications of the disease epilepsy.

Functioning as a Member of the Community. According to the Professional Advisory Board of the Epilepsy Foundation of America:

> "...there is no convincing evidence suggesting any particular set of behavioral attitudes or disorder resulting directly from seizures. However, the fact of epilepsy may have considerable impact on the individual's social experiences. The persons with epilepsy may encounter very similar social situations--overprotectiveness or a wide swing in emotional reactions on the part of parents, ostracism or taunting from peers--which have damaging effects on personality whether epilepsy is present or not. The child who faces these social and family problems compensates by fighting back. Thus, while some persons with epilepsy may display behavioral problems, it should be remembered that these may be normal reactions to abnormal situations." (EFA, Consensus, 1974)

Studies conducted by Livingston (1972) indicate that children with major motor (grand mal) epilepsy have a higher incidence of behavioral and personality aberrations. This may be due to the reaction of others when an attack of this type occurs in epileptics. The child has feelings of abnormality and "differentness" which results in personality disorders.

As previously noted in the majority (approximately 90%) of cases, epilepsy makes its initial appearance during childhood. Therefore the interaction between parent and child plays an important role in the social and emotional development of the epileptic child.

The normalcy of the home environment often depends upon the effect seizures have on the parents and other members of the family. If there is a constant fear of seizure recurrence, an atmosphere of continual tension and anxiety is created which often times causes an undesirable effect upon the patient. The epileptic patient may be resented by his parents and rejected by his siblings which only magnifies the epileptic child's feelings of being different and unwanted.

> "In many instances, the attitudes of the parents are influenced by their personal feelings in regard to their child's epilepsy disorder. Feelings of embarrasment and shame and fear of social rejection cause some parents to resort to a policy of secrecy with respect to their child's epilepsy condition. Such parents may restrict their child's social and physical activities to the extent that the child is denied the necessary normal social contacts. Epileptic children, particularly teenagers, whose activities and social contacts have been curtailed tend to manifest marked attitudes of belligerance and inferiority; many of these teenaged epileptics develop pronounced antisocial tendencies."
> (Livingston, 1972, p. 470).

Due to adverse attitudes in the community concerning epilepsy and the possibilities of injury associated with a seizure, there is a tendency for parents of epileptics to over protect their child (Sutherland, Tait & Eadie, 1974; Livingston, 1972). Overprotection may manifest itself in a number of different behaviors, e.g., constant, strict surveillance of the children; preventing the child from engaging in any activity of his own; spoiling the child. Often times unreasonable demands are guaranteed due to the parents mixed emotions of believing the epileptic is an unfortunate person who should be given the greatest possible happiness and that an emotional upset might precipitate a seizure. However, these behaviors may result in neurosis in the epileptic individual, which can be more of a threatening and critical problem than the disease itself (Livingston, 1972).

In many cases, parents of the child who has had only an occasional seizure consider him ill in the same respect as if he were afflicted with tuberculosis or rheumatic fever. This child is encouraged and in many instances forced to rest and take daily naps. This is unnecessary and harmful for the child, for once more the feelings of differentness are reinforced. It would be more helpful to the child to allow him/her to play and associate with his/her peer group in a normal manner (Livingston, 1972).

The EFA (1973) conducted a study to ascertain the problems parents encountered in raising children with epilepsy. One of the questions posed: "What do you feel is the grestest problem your child faces?" The responses were:

| Problem | Percentage Stipulating the Problem |
|---|---|
| social acceptance, attitudes and public opinion, stigma | 36.0 |
| seizures, brain damage, other medical, mental retardation | 14.2 |
| self-acceptance, self-adjustment, emotional | 13.8 |
| driving, employment, insurance | 13.5 |

According to the parents, their children encountered a number of problems with other members of the community: 30% believed their children were ridiculed and teased and 24% felt the community showed a lack of understanding and acceptance.

Problems in school were also reported by their parents: 14% stated their children had been ridiculed and physically abused, while 12% indicated teacher indifference and ignorance. However, it should be noted that more than half of the parents indicated their child had no school problems.

In the area of social adjustment, 41% of the parents indicated their children were well-adjusted, 23% felt their children had occasional problems, while 12% stated their children had extreme behavioral difficulties.

A study conducted by Collins (1973) indicated that many parents are reluctant to discuss any problems encountered by their epileptic children. However, the report tended to support the EFA (1973) findings. According to these parents (23%) said that the greatest problem their child faced was social acceptance which included: rejection of the child (9%) and fear of the child (9%). Thirty-seven percent felt their child was well-adjusted, 14% indicated average adjustment, 29% had occasional problems and 14% felt their child was troublesome.

Twenty-three percent of the children (N=35) were excluded from public school, while 54% were attending public school. A number of problems occurred in the school environment including poor student-teacher relationships (9%); the child exhibited hostile and uncooperative behavior (20%); and nine percent found the work too difficult (Collins, 1973).

The public's attitude toward epilepsy has altered somewhat over the past 25 years. Far fewer parents objected to their children playing or associating with a child with epilepsy: 1974 - 5% as compared to 1949 - 24%. Caveness, Merritt and Gallup (1969) found the number of people who consider the cause of epilipsy to be brain disorder or injury or nervous system disorder has increased - 22% in 1949 compared with 26% in 1974. Today, only 2% believe epilepsy is a form of insanity, while 86% believe there is no relationship between the two. Unfortunately, in 1974, approximately 5 million people still believed epilepsy was caused by: demonic possession, radioactive fallout, and/or exotic foods and beverages.

Education. In the past, many epileptic children had difficulty gaining admission to educational facilities, both private and public, at all levels--elementary, secondary and college. Some students were permanently removed from the normal school environment regardless of their intellectual abilities and accomplishments. However, recent data tend to indicate that only rarely are persons barred from school on the basis of a diagnosis of epilepsy per se (Livingston, 1972).

As previously noted (see life function section: cognitive-intellectual), the basic intelligence of most persons with epilepsy is essentially the same as that of normal individuals. Although some epileptics are mentally retarded there is no universal relationship between the two.

The child with normal intelligence and behavior who has infrequent seizures or relatively frequent but "mild" attacks (petit mal) can and should attend regular classes in the same manner as the nonepileptic student. Furthermore, children with nocturnal seizures (epileptic attacks associated only with sleep) should be allowed to attend regular normal schools, regardless of the frequency and type of the seizures.

It is true that some epileptic students should not attend regular public school classes with normal children. For example, some epileptic individuals do not have the intelligence necessary for normal school work; others experience seizures so frequently that they cannot perform the necessary scholastic activities, and/or disrupt the activities of both the teacher and the other pupils. The epileptic with very frequent seizures, particularly grand mal or psychomotor, in spite of normal intelligence, should not be placed in a normal classroom because of the likelihood of disrupting the activities of the teacher and the other pupils. However, children with daily petit mal spells can generally perform satisfactorily in normal classrooms, particularly when the teacher and the other students have been informed of the nature of the disorder.

The child with frequent and severe epileptic seizures and the epileptic with mental retardation and/or severe behavioral aberrations should receive his education, if he is educable, in special public school classes, through home teaching, if feasible, or in appropriate private schools or institutions. However, the exclusion from regular schools and the utilization of home instruction and/or special schools for the handicapped should be resorted to only when absolutely necessary, and the necessity can be determined, in many instances, only be a trial in a regular school environment (Livingston, 1972).

In the past, epileptics have met with problems in gaining admission to institutions of higher learning. Lennox, McBride & Potter (1948) conducted a survey to assess higher education institution policies regarding epileptics. A sample of 1676 colleges and universities were sent questionnaires.

In general, the smaller the schools the greated the reluctance to provide for epileptics. In institutions of less than 100 students, only 14 percent accepted epileptics, whereas 40% of those institutions of more than 2500 students did accept persons with epilepsy (Lennox, et al., 1948).

Schools which did accept epileptics usually imposed certain conditions which had to be satisfied or guaranteed before admittance. The conditions imposed frequently were that epileptic students should be under adequate medical care--60%; the seizures should be moderate--66%; parents should assume responsibility for any accidents--59%; there should be special rooming arrangements--18%. The larger schools were especially insistent upon proper medical care, while the smaller ones insisted upon parental responsibility.

In answer to the question of whether epileptic students had proven satisfactory, 76% of the schools reported favorably, 24% unfavorably. Of schools that admitted epileptics conditionally, the results were favorable in 86 percent (Lennox, et al., 1948).

A 1972 survey of 482 community college student personnel deans indicated that epileptic seizures constitute the most common health problem on campuses (Nichols, 1972). This implies that many students with epilepsy go on to higher education. Abraham (1956) surveyed 143 colleges and found 322 students with epilepsy in a student population of 572,305. College policies did not seem to be discriminatory since 55% of the colleges admitted students with epilepsy generally or conditionally and 34% had no special regulation regarding students with epilepsy. Only 31 of 143 colleges provided information on epilepsy to its faculty.

Recreation. A large proportion of epileptics can work, attend school, participate in sports, drive a car (if seizure free), marry and have children. Furthermore, it has been found that epileptics have fewer seizures, if they lead active productive lives (EFA, 1973).

According to Livingston (1972), the individual with epilepsy, if physically able, should participate in most physical activities. He notes that the majority of epileptic patients experience fewer seizures when physically active than when idle. Gotze et al. (1967) concluded this phenomena is created by the physical exercise which elevates the seizure threshold, thereby reducing the likelihood of seizures.

Opinions differ as to the relative merits of physical activity for epileptics. This is related to a number of factors: the frequency of seizures, type of seizures, the extent of the epileptic's physical activity prior to the onset of epileptic attack.

It is advised that epileptics, who are not seizure free, should not engage in certain physical activities: Horseback riding, mountain climbing, bicycle riding. However, in patients with infrequent seizures, who have previously learned to bicycle ride, the problem consists of weighing the risks of injury associated with bicycle riding against the risk of causing emotional harm or making the child feel different if he/she is prohibited from riding a bike.

The position taken by the AMA (1968) is "...participation should include any sports of interest with the exception of boxing, tackle football, ice hockey, driving, soccer, rugby, lacrosse and other activities where chronic recurrent head trauma may occur".

However, Livingston (1972) takes issue with this statement noting there are no studies in the medical literature which indicate head trauma causes a recurrence of pre-existing epileptic seizures, and that hundreds of epileptic patients play the prohibited sports with no ill effects. Those with myoclonic epilepsy (a minor motor epilepsy, which is a severe, organically based form of epilepsy often resulting in mental retardation and deterioration), are not affected by head injuries caused by falling to the ground. Furthermore, Livingston believes severe emotional disturbances may occur when these prohibitions have been enforced.

Many parents prohibit children from engaging in physical activity because of the fear that hyperventilation may precipitate an attack. While it is true that "overbreathing" does precipitate petit mal seizures in some patients, usually physical activities do not cause an individual to hyperventilate to a degree which would result in a seizure (Livingston, 1972).

## Service Delivery

Epilepsy Foundation of America: There are a number of lay non-profit organizations in the United States which attempt to serve the needs of the epileptic population. The largest organization is the Epilepsy Foundation of America. It was founded in 1960, and today boasts of 154 chapters (a 1973 figure) and 40,000 chapter members (EFA, 1975 - Basic Statistics on the Epilepsies). There are also a number of splinter groups, which supplement the EFA, e.g., the National Epilepsy League.

The EFA espouses a four-fold goal:

1. To mobilize effective community action programs aimed at securing equal education and employment opportunities for epilepsy patients.

2. To institute service programs including clinics, rehabilitation centers and workshops.

3. To stimulate and support research of this disorder.

4. To educate both the public and the professional community about the needs and problems faced by epileptics, and thereby, eliminate the prejudices about epilepsy

To implement these goals, a program has been devised which includes three major areas: medical, social and information (Table 1-20).

TABLE 1-20

EFA PROGRAM AREAS & GOALS

| Medical | Social | Information |
|---|---|---|
| medical assistance | education & training | |
| evaluation | protective and socio-legal | |
| comprehensive health planning | transportation | |
| research | treatment | |
| education and training | employment & vocational rehabilitation | |
| treatment | financial & public assistance | |
| diagnosis | counseling | |
| maternal and child care | referral | |
| mental health | public education | |
| | information management | |

Source: (EFA, 1974)

Local Organizations: There are a number of epilepsy organizations operating at the local level (county, city, state) in many areas throughout the U.S. and Canada, which offer services to both physicians and epileptic patients. The physician is supplied with nonmedical information pertaining to epilepsy, i.e., socioeconomic data to assist the physician in counseling an epileptic patient.

Patients and their families are assisted in a number of ways: (1) aided in securing employment, e.g., vocational training, changing employers' attitudes; (2) support for patients and their families, especially during times of crisis, e.g., help in obtaining better medical control, counseling for improved self-concept, interpersonal relationships and family relationships; (3) special activities, e.g., picnics, parties, summer camps. Local organizations also disseminate films and pamphlets dealing with epilepsy to the community (Livingston, 1972).

National Epilepsy League: As previously noted, the National Epilepsy League, a non-profit organization, is a splinter group of the EFA. Its services, limited to epileptic patients only, involve filling prescriptions authorized and signed by the member's own physician. Prescriptions are filled from anywhere in the U.S. and its possessions at league headquarters, by its own pharmacists, with the League paying for postage. The League does not offer medical advice, diagnosis or treatment, rather its major objective is to more effectively supervise and deliver drugs to epileptic patients (Livingston, 1972).

Crippled Children's Agency: In some states the Crippled Children's agency has developed programs which offer overall medical care to qualified patients under the age of 21. These programs are supported by federal, state and local funds. In 1967, the state crippled children's special epilepsy program handled a 14,881 medical caseload. No charge was made for diagnostic services and additional fees were assessed on a sliding scale of payment. In two-thirds of the states, crippled children's services are administered by state health departments. In the remaining one-third, the state university medical school, state department of welfare or education, or a specific commission administers the program. Each state receives a federal grant from the Children's Bureau and part of the grant is matched with state and local funds (Livingston, 1972).

Epi-Hab: Epi-Hab stands for Epilepsy Rehabilitation and is a non-profit corporation chartered under non-profit laws. This organization provides epileptics with on-the-job training, technical instruction by qualified instructors and placement in private business and industry. Epi-Hab is an outgrowth of a VA experimental workshop which was designed to determine the beneficial effect of steady gainful employment on the control of seizures and to further promote the economic rehabilitation of the epileptic. Centers are located in Los Angeles, Phoenix and Evansville, Ind., with all but the latter receiving initial federal funding.

Epi-Hab is the exclusive supplier of all trained and rehabilitated labor for a subsidiary organization, Epihab Packaging Co. This subsidiary is managed by a private parent corporation, Container Service Co., which is directly associated with EpiHab projects through a contractual agreement (Livingston, 1972).

## INSTITUTIONS

There are many special schools, hospitals, institutions and rehabilitative facilities in the United States, which offer comprehensive ambulatory and resident programs for the medical, emotional and social management and rehabilitation of epileptics and other handicapped individuals. According to EFA, approximately 7,100 hospitals, 168 VA hospitals, and 115 medical schools in the U.S. serve the medical needs of persons with epilepsy (EFA, 1975).

In teaching hospitals in the larger cities, a variety of services are offered to epileptic children. The vast majority of medical supervision is directed by physicians associated with the neurology, pediatric, or psychiatric departments. However, there are relatively few medical centers with one facility which offers overall assistance (medical, psychological, and socioeconomic guidance for the child with epilepsy. Presently, there is only one facility in the U.S. which limits its services specifically to the epileptic child, the National Children's Rehabilitation Center in Leesburg, Virgina (Livingston, 1972).

## FUTURE SERVICE DELIVERY NEEDS:

Questionnaires and personal contact at several recent national and regional pediatric medical conventions (1967, 1968, 1969) demonstrated a vast majority of pediatricians diagnosed and totally treated most of their own epileptic patients (Livingston, 1972). However, there is a great need for the establishment of separate diagnostic and follow-up clinics for epileptic children, as adequate treatment of the epileptic entails a holistic approach, directed not only to the control of seizures but also to the general welfare of the patient and his/her family (Livingston, 1972).

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# CHAPTER 2
# DISABILITY ANALYSIS: MENTAL RETARDATION

## I. Definition

The most recent revision of the American Association on Mental Deficiency (AAMD) Manual on Terminology and Classification in Mental Retardation (Grossman, 1973) offers this definition:

> Mental Retardation refers to significantly subaverage general intellectual functioning existing concurrently with deficits in adaptive behavior, and manifested during the developmental period.

-Significantly subaverage means two or more standard deviations below the mean of the IQ test (68 or below on the Stanford-Binet, 69 or below on the Wechsler).

-Levels of retardation based on Wechsler IQ scores are as follows: Mild (69-55), Moderate (54-40), Severe (39-25), and Profound (24 and below). Mild MR is roughly equivalent to educable mentally retarded (EMR, or IQ 50-75), while moderate MR corresponds to trainable mentally retarded (TMR, or IQ 30-49).

-Adaptive behavior is the "degree of effectiveness with which the individual meets the standards of personal independence and social responsibility expected of his age and cultural group." Intelligence and adaptive behavior are correlated, but not perfectly; hence the two-pronged definition of mental retardation. The manual specifies four levels of deviation from the norm in adaptive behavior (again, mild, moderate, severe, and profound), but since norms for the general population are not available, and tests of adaptive behavior, even the AAMD's own Adaptive Behavior Scale, are limited, determination often comes down to the clinician's judgment.

## II. Societal Characteristics of the Mentally Retarded

The literature provides information about prevalence, incidence, mortality, and costs associated with the mentally retarded.

## Incidence and Prevalence

Prevalence figures vary widely due to different criteria of mental retardation and different methodologies of establishing prevalence figures, with the greatest controversy revolving around the size of the mildly retarded group.

The figure most often given is 3% of the population, a figure which is based on the statistical concept of normal distribution. In other words, if everyone in the country were given an IQ test, 3% of them would be expected to be two or more standard deviations below the mean of 100 (IQ below 70). Normal curve logic would suggest that if the population of the US is 210,000,000, 63,000,000 persons are mentally retarded and of these, 85% or 5,460,000 are mildly retarded (roughly IQ over 55), while 15% or 840,000 are below 50 in IQ (Gearheart & Litton, 1975.) The President's Committee on Mental Retardation (1976) estimates the number of retarded persons in the United States to be between four and six million. The immediate families of the mentally retarded include approximately 20 million people who are directly affected by retardation.

There are many factors which can affect estimates of the retarded population including the age group surveyed, the definition of MR, and the locale of the survey. In house-to-house canvas studies, Wiskik (1956) identified 4.0% of children from birth to age 21 in two counties in Georgia as mentally retarded, while Richardson and Higgins (1964) arrived at a figure of 7.7% in a North Carolina county. It should be noted that estimates of the prevalence of mental retardation are generally higher when school-aged populations are studied thatn when the whole age range is considered. "Most mentally retarded persons are first identified at five or six years of age when they enter school and are subject to intelligence tests (Presidents Committee on Mental Retardation, 1975)." This has led to a phenomenon known as the "vanishing retarded"--school children labeled retarded, particularly in the mild range, who grow up and disappear into the community, apparently functioning as normal adults (Tarjan, Wright, Eyman, & Keeran, 1973).

There has recently been a lowering of estimates of the prevalence of MR from 3% to 1% which is largely due to a change from statistical prediction of IQ scores to actual identification using the AAMD definition of MR which stipulates that in addition to subaverage intellectual functioning, based on scores on standardized IQ tests, there must be an accompanying impairment of adaptive behavior. Thus, there are apparently several million people in the US who would score two standard deviations or more below the mean on an IQ test, but who are otherwise at least fairly well adapted to and able to function in their environment. Mercer's (1973a, 1973b) survey of the entire age range in Riverside, California, yielded estimates of the number of retarded which were considerably lower than 3%. In her article entitled, "The Myth of 3% Prevalence," she concludes that, based on a count of persons labeled as retarded by various agencies and organizations and by citizens in a household survey, the rate of mental retardation was closer to 1% than to 3% even though many persons labeled retarded had IQ's above 70 (Mercer, 1973b). Based on actual IQ scores and a measure of adaptive behavior used with a sub-sample, the estimate was again closer to 1% than to 3%. Mercer's data also support the views of Dingman & Tarjan (1960) and Zigler (1967) that there are more persons below 50 IQ than would be expected statistically, and that many such persons are organically defective and are quite distinct as a group from retarded persons of higher IQ. According to Tarjan (1964), there is probably good reason to believe that 3% of the newborn babies will develop as mentally retarded persons, but this does not mean that 3% of the population is retarded because mentally retarded persons are identified at various ages, do not always remain unchanged through life, and die earlier than the general population. Prevalence rates are low in the preschool years, high in the school years, and low again for persons over 25--a finding which undoubtedly has to do with the fact that the schools are the largest single labeling organization. A six-year long survey by Connecticut's Seaside Regional Center, using the Heber-AAMD definition of mental retardation, supports the one percent estimate. Of about 338,000 people in that region, only 2,587 persons, or 0.8 percent of the population were diagnosed or had ever been diagnosed mentally retarded (PCMR, 1975).

In conclusion, the 3% figure may be roughly accurate for the school age population, but it appears that a prevalence figure of roughly 1% is more accurate for the general population. Incidence figures are difficult to estimate because only a small percentage of mentally retarded persons have organic defects detectable at birth; the majority are identified in the early school years. The Etiology section of this report (Table 4-1) does present incidence rates for several organic conditions.

If some current trends continue, the rate of mental retardation is likely to increase somewhat. In recent years, medical science has prevented the infantile deaths of many severely and multiply handicapped retarded persons; moreover, medicine and improved health and living conditions have increased the life span of the retarded. Expansion and improvement of early identification techniques and service delivery systems have meant that more persons come to be labeled mentally retarded. On the other hand, new medical technology has led to the prevention of some types of retardation and early intervention holds some promise of preventing still more. In addition, there is always the possibility that the definition of mental retardation will change, just as it did when the AAMD dropped the borderline (IQ 70-85) category from the definition. Even given the current definition, as measures of adaptive behavior become more sophisticated and are used as equal partners with intelligence tests in diagnosis, one would expect the rate of mental retardation to decrease, particularly among minority groups - judging by Mercer's (1973a) study. On the other hand, one could expect an increase in the rate of mental retardation as society grows more complex and adaptation requires more decision-making skills.

### Mortality:

The mortality rate of the mentally retarded exceeds that of the normal population and the excess varies greatly as a function of the severity of the retardation. That is, mortality rate is much higher for the severely retarded than it is for the mildly retarded.

Conley (1973) gives a concise description of the excess mortality rate of the mentally retarded which is summarized below:

1. Nine of ten below IQ 25 die within 5 years of age. 1 of 2 of IQ 25-50.
2. Most deaths occur in the first year of life.
3. Apparently, about half of the children who die during the first year of life would have been severely retarded had they lived.

4. These high mortality rates are not due to low intelligence but associated severe physical ailments.
5. Mortality rates among severely retarded adults have declined drastically during the last 50 years as major causes of death have been controlled.
6. However, relative mortality rates between the severely retarded and the general population has remained fairly constant--3 times the average for people of IQ less than 25 and twice the average for IQs 25-50.

Conley estimates an excess mortality rate of 25% among the mildly retarded. The excess mortality of the mildly retarded as compared to the normal population is relatively small (relative to the severely retarded).

Costs:

The costs of mental retardation, both in terms of actual expenditures for care and loss of earnings by the retarded, runs into billions of dollars annually (PCMR, 1976).

Conley (1973) estimates that the average annual per patient cost in public institutions was $5,865 in 1970 (p. 6). This figure includes capital costs. Of course, not all of this amount would be saved if a person were not in an institution since it includes educational and developmental activities for children which would be spent even if they were not institutionalized. However, the cost of custodial care is left at about $3,450 per institutionalized patient per year that society must pay. The total cost of care for retarded persons in public institutions was $1,095,300,000 in 1970 (p. 6).

In 1970, the earnings loss for the institutionalized retarded was estimated by Conley to be approximately $707,553,000, while the earnings loss for the non-institutionalized retarded was estimated to be $13,435,000,000. Thus, the total earnings lost for all retarded people in 1970 amounted to approximately $14,142,553,000 (Conley, 1973, p. 172).

Conley (1973) points out the economic advantages that would accrue to the retarded who are trained and subsequently employed. He estimated that if an 18 year old, mildly retarded male entered the labor force in 1970, the worker would earn an estimated $503,000 during his working career. For the mildly retarded female, the estimated income for the same time span would be $101,000. For the moderately retarded male and female the estimated income over the same time period would be $62,000 and $9000, respectively. When these figures are compared to the cost of institutionalization or welfare payments that idle workers would receive, the savings to the community are enormous. (Each one dollar spent on educating the mildly retarded generates an estimated $14 in future earnings; lifetime custodial cost to institutionalize the retarded is $400,000) (Conley, 1973). In order to attain these economic goals, the retarded must first be trained in either sheltered workshops or in special education classes in the public schools.

## III. Demographics

The organic mental retardation more common among those with IQs lower than 50 tends to be distributed more evenly across societal groups than the "cultural familial" retardation typical for persons with IQs above 50. Taking the whole mentally retarded population into account (including the mildly retarded):

1. Boys tend to be labeled retarded more often than girls

2. Mental retardation is estimated to be 6 to 7 times more prevalent among non-whites than whites (Conley, 1973).

3. Mental retardation is reportedly 13 times more prevalent among the poor than among middle or upper income groups (Conley, 1973).

4. MR is more prevalent in isolated rural areas and urban ghettos (Conley, 1973). Stedman (personal communication) has estimated that prevalence figures are roughly 2% in middle and upper class suburbs, 5% in rural areas, and 7% in inner cities.

An important qualification is in order, however. Although the poor and the non-white are more often subject to adverse prenatal, natal and postnatal environmental influences which underlie mental retardation, they are also penalized by culture biased IQ tests and adverse factors in testing situations. The fact that IQ alone is a poor criterion for labeling the poor and non-white mentally retarded was demonstrated by Mercer (1973), who found that the prevalence of mental retardation was reduced by approximately half when adaptive behavior scores were used along with intelligence test scores in defining mental retardation. Many persons with IQs above 50 but below 70, primarily blacks and Mexican-Americans, scored in a normal range on the adaptive behavior test used in the study and were not mentally retarded according to the two-pronged definition. Additional descriptions of the demographic characteristics of the retarded in the US in specific areas such as membership in the community and work force can be found in sections on these areas which follow.

## IV. Etiology

The causes of mental retardation are varied, and in most cases, unknown. This has led to numerous dichotomies in classifying Etiological causes of mental retardation. Perhaps the most widely known dichotomy is that between the so-called "cultural-familial" and organic retardation. This dichotomy has also gone under such names as endogenous vs. exogenous, innate vs. acquired, and other terms synonymous with the nature vs. nurture argument. The most widely accepted medical classification system is that adopted by the American Association of Mental Deficiency which is built around the following major diagnostic categories:

1. MR following infection and intoxication;
2. following trauma or physical agent;
3. associated with disorders of metabolism or nutrition;
4. associated with gross brain disease (postnatal);
5. associated with diseases and conditions due to unknown prenatal influences;
6. with chromosomal abnormality;
7. gestational disorders (prematurity);
8. following psychiatric disorders;
9. environmental influences and other conditions.

Several examples of the causes of mental retardation are given below:

1. Prematurity-low birth weight. Estimates suggest that possibly as much as 50% of all mental retardation can be traced to problems in the prenatal or perinatal period. Prematurity (gestation time of less than 37 weeks) and low birth weight (less than 5 pounds, 7 ounces) are

associated with brain damage (Knobloch, 1956). Low birth weight is associated with such factors as poverty, poor prenatal care, maternal diet, race, maternal age, and smoking.

2. Metabolic disorders. Phenylketonuris (PKU) is an error in metabolism which occurs in one of every 14,000 live births. Retardation caused by the condition can be prevented through early detection and dietary treatment.

3. Infections. The rubella epidemic of 1964 is estimated to have caused 20,000 to 30,000 cases of multiple defect, including mental retardation.

4. Chromosomal disorder. The extra chromosome anomaly associated with Down's syndrome is estimated to occur once in every 600 to 700 live births and is more likely as the mother's age increases (Motulsky, Arnog, Hecht, and Frederick, 1964).

5. The Rh Factor. When a Rh- mother has an Rh+ child, the mother builds antibodies which can destroy the child's cells and result in death or brain damage. Although the incompatible blood condition is expected in one out of 12 pregnancies, the hemolytic anemia which causes problems for the child occurs in only one out of 200 births (Ford, 1960). Blood transfusion and Rh gamma globulin injection (available since 1970) can significantly reduce this type of mental retardation. However, in 1973, it was estimated that only 80% of women at risk were treated immediately after delivery of a first child to protect against danger to future children and many more cases involving abortion were untreated.

In relation to the cultural familial versus organic etiological dichotomy, Gurenberg (1959) notes that 44% of the first admissions to New York State Schools for the Mentally Retarded in 1957 had organic conditions present. The percentage of cases with organic conditions present increased as the severity of the retardation increased. Of the mild-moderately retarded admissions, 16.7% had organic conditions present, while 76.4% of the profoundly retarded admissions exhibited organic conditions.

Gearheart and Litton (1975) list the incidence figures for several disorders and conditions which may lead to retardation. This list is summarized in Table 2-1.

TABLE 2-1

INCIDENCE FIGURES FOR DISORDERS THAT MAY CAUSE RETARDATION*

| Disorder | Incidences |
|---|---|
| Metabolic nutritional: | |
| Hurler's Disease | 1:10,000 births |
| Tay-Sachs disease | 1:6,000 American Jewish births |
| Phenylketonuria | 1:12,000 births |
| Galactosemia | 1:70,000 births |
| Cretinism | 1:20,000 births (estimate) |
| Wilson's disease | 1:100,000 births |
| Gross brain disease disorders: | |
| Tuberous sclerosis | 1:20,000-30,000 births |
| Neurofibromatosis | 1:2,500-3,300 births |
| Unknown prenatal influences: | |
| Hydrocephalus | 1:1,500 births |
| Microcephaly | 1:1,000-3,000 births |
| Cornelia de Lange syndrome | 1:30,000-50,000 births |
| Chromosomal abnormalities: | |
| Down's syndrome | 1:600 births |
| Cri-du-Chat syndrome | Not known |
| Klinefelter's syndrome | 1:1,400 male births |
| Turner's syndrome | 1:3,300 female births |

*Adapted from Gearheart & Litton, 1975.

Mental Retardation and Other Handicaps. It is often difficult to separate the etiologies and symptoms of pure mental retardation from those of other disabilities, since particularly in the lower IQ ranges, mental retardation is often accompanied by other handicaps. For example, rubella is also associated with deafness and blindness, and the proportions of mentally retarded children in schools for the deaf and schools for the blind are high. Physical disabilities, epilepsy, and various chronic conditions are also common among the mentally retarded.

## V. Life Functions

Because the mentally retarded differ so much among themselves, it is difficult to assign overall levels of impairment in the five life function areas. According to Kirk (1972), the EMR may be expected to be unable to profit sufficiently from a regular school program, but has potentialities in academic subjects and social adjustment, and has minimal occupational adequacies. The TMR is not educable in the traditional sense but has potentialities for training in self-help skills, social adjustment in the family, and economic usefulness. The totally dependent retarded are difficult or impossible to train in total self-care, socialization or economic usefulness and require almost complete care and supervision throughout life.

The very heart of mental retardation is clearly a deficit in cognitive-intellectual functioning. This deficit has implications for functioning in other areas; i.e., one must learn in order to be mobile, communicate, and function in social settings. While many life function deficits are related to the cognitive deficit, others are associated with the disabilities which often co-occur with mental retardation--e.g., deafness, blindness, epilepsy, cerebral palsy, and physical disabilities. Conley (1973) estimates that perhaps 1 in 2 retarded children is multiply handicapped, and that for persons with IQs below 25 multiple handicaps are almost universal while for the mildly retarded the rate is more like 25%. The life functions data reflects the fact that deficits are not necessarily attributable to "pure" mental retardation, although deficits may vary with different levels of mental retardation. The following sections present brief descriptions of the five life functions. Following each general discussion is a table detailing some of the specific disabilities mentioned in the literature, along with the dynamics of the disability and source of the reference.

## Individual Life Functions

### Mobility

It can be expected that many retarded children will be delayed in motor development and that for children with IQs below 10-15, walking may never develop. Slightly over 30% of the retarded suffer additional physical handicaps, according to Conley (1973). According to Conroy and Derr (1971), 9.9% of the retarded have a severe handicap with respect to ambulation--i.e., they are able to take a few steps with help or are totally unable to walk. Partial handicap in ambulation affects 32.4%.

According to the same source, gross motor control of the upper limbs is a severe handicap for 8.2% and a partial handicap for 34.2%. Problems in fine motor control affect approximately the same percentages of the retarded population. Ayoub, et al., (1976) at Texas Tech University have noted that institutionalized retarded are often below average in capacity for physical work. Retarded persons, even those in the moderate and mild categories, often face barriers to mobility in the community.

They are generally not permitted to drive or have difficulty passing driving tests. They need special training to learn to find their way on foot in the community, or use buses and other forms of public transportation.

It should be mentioned that the retarded are much nearer to norms for normal children in motor development than in mental development. Yet the retarded still need to be taught basic physical education skills such as balance, locomotion (walking, running, jumping, hopping, skipping, and sliding), and fundamental body mechanics (throwing, catching,and any fine motor skills) (Gearheart & Litton, 1975).

## TABLE 2-2

## LIFE FUNCTION TABLE-MENTAL RETARDATION: MOBILITY

| Statement of Problem | Dynamics | Source |
|---|---|---|
| For some walking may never develop | For those with IQs of below 10-15. | Conley (1973) |
| Severe handicap with respect to ambulation; partial handicap with respect to ambulation | 9.9% of population studied<br>32.4% " " " | (PCMR, 1975)<br>Conroy & Derr (1971) |
| Gross motor control of the upper limbs is severely limited. | 8.2% " " " | " " |
| Motor control of the upper limb is partially limited. | 34.2%" " " | " " |
| Fine motor control | About the same % as gross motor control | " " |
| Those who have been institutionalized are often below average in their capacity for physical work. (Heart rate capacity) | Limits vocational choices semi-skills jobs which are available frequently require high continuous physical output. Retarded are limited to less demanding (physically) jobs. | Ayoub et al. (1976) |
| Balance | Retarded need to be taught basic physical education skills and fundamental body mechanisms. | Geartheart & Litton (1975) |
| Coordination | " " | " " |
| Body Mechanisms | " " | " " |
| Inability to procure driver's license. Retarded have problems getting back and forth to work and other places. | Only 25% have licenses<br>25% of those with IQs of 55 or higher | Bell (1974)<br>Clark et al. (1968) |
| Low level defectives have a higher incidence of skeletal deformities | | Malpass in Ellis (1963) |
| Body movement often clumsy & ungainly. | | Tredgold (1956) in Ellis (1963) |
| Walk at a later age than normals. | 45% did not walk by 16th mo. of life and 20% did not walk until the 26th month. | Malpass (1959) in Ellis (1963) |
| Less opportunity for independent travel. | Due to lack of public transportation and inability to drive or obtain driver's license. | "Transportation & the Mentally Retarded," PCMR, 1972 |

## Health

According to Conley's (1973) review of the literature, most severely retarded persons--9 out of 10--with IQs below 25, and 1 out of 2 with IQs from 25 to 50--die within the first five years of life, with most deaths occurring in the first year. These high death rates are a consequence of serious physical ailments which often accompany severe retardation. As shown in the Life Function table, Conroy and Derr (1971), in a national sample of 14,086 persons labeled retarded, found that 31.1% had a severe handicap associated with chronic organic condition. The table indicates the percentages of persons affected by each of several conditions.

The life span of the retarded is shorter than that of the general population. Before World War II, studies placed the life expectancy of persons with IQs below 25 at about 20 years and of persons between 25 and 50 IQ at 30 years (Conley, 1973). Life spans have increased since then, however, as a result of better medical care and treatment.

## Communication

In a review of the literature, Keane (1972) discusses the well-documented high incidence of communication (speech, language, and hearing) disorders in the mentally retarded. The incidence of communication problems is higher among the institutionalized retarded than among the noninstitutionalized. Furthermore, problems increase as retardation becomes more severe, and for children with IQs below 10 or 15, it is very unlikely that any speech will develop.

Among the speech problems most often found in the retarded are articulation, voice, and stuttering difficulties. Articulation disorders are the most prevalent, with voice disorders probably second (Spradlin, 1963).

### Table 2-3

### LIFE FUNCTION TABLE-MENTAL RETARDATION: HEALTH

| Statement of Problem | Dynamics | | | Source |
|---|---|---|---|---|
| | 0-29 | 30-54 | 55-69 | |
| Incidence of: Cerebral Palsy | 46.5 | 11.6% | 6.9% | Conley (1973) |
| Incidence of: Epilepsy | 11.3 | 7.5% | 10.6% | " " |
| Premature deaths (1st 5 years) | 9 out of 10 of those with IQs below 30, 78% with IQs between 30-55, 37% of those who are mildly retarded (Edinburg). | | | Conley (1973) |
| Shortened life expectancy | For those with IQs below 25, life expectancy is 20 years, for those whose IQ is between 25-50, the life span is 36. | | | Conley (1973) |
| 6.5% - upper respiratory disease | Other chronic organic conditions abnormally affecting the mentally retarded. | | | Conroy & Derr (1971) |
| 3.4% - heart disease | | | | |
| 4.9% - extreme obesity | | | | |
| 5.4% - dental or orthodonic disorders | % of retardates with multiple handicaps; 95% of those with IQs below 30, 78% with IQs between 30-55, 37% of those who are mildly retarded (Edinburg) | | | Conley (1973) |
| 3.4% - metabolic endocrine | | | | |
| 2.9% - skin disorders | | | | |
| 2.1% - cosmetic deficit | | | | |
| T.B. | Death from these assaults are 3%-13% higher than in the normal population | | | Conley (1973) |
| Pneumonia | " " | | | " " |
| Influenza | " " | | | " " |
| The retarded have a higher incidence of physical defects | Retarded had an average of 1.55 physical defects while normals had an average 1.08 physical defects. | | | Blatt, B. (1958) AJMD, 62:810-818. |

Table 2-4

LIFE FUNCTION TABLE-MENTAL RETARDATION: COMMUNICATION

| Statement of Problem | Dynamics | Source |
|---|---|---|
| Incidence of communication problems higher among the institutionalized than others. | | Keane (1972) |
| Lack of the ability to speak | Those with IQs in the 10-15 range | " " |
| Inability to articulate most prevalent disorder. | 52%-57% of those sampled | Spradlin (1971) |
| Voice disorders second. | 52%-57% of those sampled | Matthews (1971) |
| Difficulty in communicating needs and wants. | 21.5% of those sampled | Conroy & Derr (1971) |
| Hearing impaired 10%-15% | High incidence of hearing loss compared to normals | Lloyd (1971) |
| Visually impaired 10%-15% | | " " |
| Echolalic Speech | | Lloyd (1971)<br>&<br>Schlanger (1953)<br>in<br>Baumeister (1967) |
| Stuttering | | |
| Aphasia - perservation, jargon-stimuli | | |
| Delayed language | | |
| Disordered language | | " " |
| Reading levels are depressed | Directly related to IQ | |
| Abstraction less common in language | | Byan & Werner (1954)<br>Mein & O'Conner ('60)<br>in Baumeister (1967) |
| Do not use language to direct behavior or fixate experiences as normals do. | | Luria (1963)<br>in Buameister (1967) |
| Less use of prepositions, pronouns and verbs. | | Sievers & Essa (1961)<br>in Baumeister (1967) |
| Smaller vocabulary size | | Baumeister (1967) |
| The mentally retarded are generally reading below their mental age-reading grade expectancy. | | Kirk, 1964 |

Overall, Spradlin estimates that over half (52-57%) of the retarded have speech defects, an estimate which has been confirmed by Matthews (1971). According to the Conroy and Derr (1971) survey summarized in the Life Functions table, 21.5% of the retarded "can possibly communicate needs or wants but use few or no words," and overall over 50% have at least a partial handicap.

Approximately 10-15% of the retarded are hearing impaired, with approximately 2% or 3% of them totally deaf (Lloyd, 1971). A similarly high percentage are visually impaired or blind, which poses still more problems in the area of communication. Finally, the cognitive impairments of the mentally retarded pose problems in receiving and interpreting messages, as well as in expression, even if the sensory apparati are intact.

Cognitive-Intellectual Functions

The mentally retarded are, by definition, characterized by a deficity in intellectual functioning. The deficit may make learning of all but the simplest associations impossible for those with very low IQs. Although learning, remembering and transfering learning to new situations are major handicaps for the mentally retarded, research in recent years, much of it involving the use of operant conditioning learning paradigms, has led to a much more optimistic view of the retarded person's ability to learn.

Much attention has focused on the cultural-familial retarded, who generally represent 80% of the retarded and predominate in the higher ranges of retardation (Robinson & Robinson, 1965; Girardeau, 1971). (The cultural familial individual does not have an indentifiable biological pathology and has a sibling who is retarded.) Both genetic and environmental factors are assumed to underlie such retardation, through their roles and interactions are not explained, and several theories use physiological explana-

## Table 2-5

## LIFE FUNCTION TABLE-MENTAL RETARDATION: COGNITIVE-INTELLECTUAL

| Statement of Problem | Dynamics | Source |
|---|---|---|
| Slower discrimination learning. | Slower to discriminate relevant cues from non-relevant. Once learning begins, they learn about the same rate as normals. Actually, slower to begin learning. | Zeaman & House (1963);<br>Fisher & Zeaman (1973) |
| Slower reaction time. | Significant correlation between MA and RT for familial retardates but not for brain injured. | Bensberg & Cantor (1957) |
| No mediational transfer, or at least, less than normals when there is little or not overtraining. | Normals learn ED shifts slower than R shifts (negative transfer) whereas retardates learn R & ED shifts at the same rate. | Sanders, Ross & Heal (1965) |
| Overlearning slows down ED shifts in retardates but not in normals. | Normals transfer responses to the relevant dimension more quickly than do retardates. | Heal (1964) |
| Retardates do not process repetitive stimuli as fast as do normals. | | Holden (1970) in |
| Lower digit-span channel capacity. | 3-4 for educable retardates and 5-7 for normals. | Herman Spitz (1973) |
| Poor retrieval (free recall) | In verbal clustering studies where words which are amenable to clustering are presented at random, retardates (educ) recall 11 of 20 by 5th trial while college students recall 17. | Gerjuoy & Spitz (1966) |
| Inhibition deficit | Significantly more trials required for retardates to totally inhibit eye-blink response than for normals. Longest for organically retarded as compared to familial and psychogenic. | Berger (1954) in |
| Retardates have difficulty in acquisition of information. | | Morelan (1972) |
| Consolidation Deficit | | Ellis (1970);<br>Belmont & Butterfield (1969)<br>Robinson & Robinson<br>Girardeau (1971) |

Table 2-5, cont'd.

| Statement of Problem | Dynamics | Source |
|---|---|---|
| Society's acceptance of IQ as an indication of a person's ability to function. | Over 50% of studies indicate that IQ is not a necessary variable in achieving success (5 studies found it to be negatively correlated). | McCarver & Craig (1973) |
| Weaker orienting response | Stimuli of weak intensity which evoke OR in normals often will not for retardates. | Luria (1963) |
| More distractible: inability to maintain an orientation for the relevant stimuli | OR to stimulus extraneous to a task more likely in retarded than normal. | Luria (1963) |
| Weaker stimulus satiation | When presented with two design displays, one constant and one varying, normals spend more time looking at the varying design than do retardates. Normals satiate to constant design quicker. | Terdal (1967b) |
| IQs are lower than the normal population | | Grossman (1973) |
| The mentally retarded are incapable of completing academic secondary school requirements. | | Stevens (1964) |
| The mentally retarded achieve at a lower level in arithmetic reasoning than in arithmetic computation. | | Kirk (1964) |
| Poor performance in verbal rote learning | | For a comprehensive review of the literature on this topic, see: Denny (1964). |
| Lack of verbal control of the motor sphere. | | " " |
| Poor performance on abstraction tasks | | " " |
| Difficulty in performing verbal instructions | | " " |
| Increased resistance to extinction in classical conditioning | | " " |
| Delayed conditioned response | | " " |

Table 2-5, cont'd.

| Statement of Problem | Dynamics | Source |
|---|---|---|
| Conditioned inhibition cannot be established | | For a comprehensive review of the literature on this topic, see: Denny (1964). |
| Difficulty with differential conditioning | | " " |
| Susceptible to disinhibition | | " " |
| Difficulties in complex learning ability | | " " |
| Need to use familiar non-verbal material for rote learning | | " " |
| Initially retardates do very poorly in motor skill tasks. | | " " |
| Minimal degree of intellectual curiosity. | | " " |
| Difficulties in attending to or orienting to verbal stimuli | | " " |
| Among the academic subjects have the greater difficulty with reading. | Mildly retarded. | Quay (1963) |
| Below normals of the same mental age in abilities to locate pertinent facts, main ideas, and draw conclusions. | | Cegelka (1970) |
| Below mental age expectancy in ability to comprehend and reason arithmetic word problems. | | Kirk (1964) |

tions to account for this type of retardation. Morelan (1972) provides a brief description of the nature of the deficits:

> The last decade has witnessed an increased scientific interest in the learning, or more properly, the learning deficiencies of mental retardates (Baumeister, 1967). As a result of this interest, there is evidence from many sources which indicates that the mentally retarded are capable learners. After reviewing current rote verbal learning studies, Prehm (1970) reported that the learning performance of the retarded is most similar to that of normal children when (a) the materials are concrete, (b) the response required is unitary, and (c) the materials are meaningful. After reviewing research on the learning abilities of the retarded, Baumeister (1967) reported that compared with normal individuals, mental retardates, as a group, are inferior in acquisition and comparable in retention. This deficit in acquisition may reflect an inability to efficiently transfer information from primary memory into secondary memory. Simply stated, the retarded take more time to learn than do normals. It seems possible that cultural-familial retardation may be nothing more than physiological inefficiency in the process(es) involved in consolidation. There is converging evidence from studies investigating the mentally retarded which seems to indicate that the retarded do not exhibit a short-term or a long-term memory deficit, but a consolidation deficit. Ellis (1970) provides evidence that the learning deficit exhibited by the mentally retarded is due to a failure of the rehearsal mechanisms which enable one to transfer information from short to long-term storage. Some process of consolidation (e.g., acquisition, fixation) is required to transfer information from primary memory into secondary memory and that this process is deficient in the retarded.

## Social-Attitudinal Functions

Windle (1962) and others who have reviewed the literature on post-institutional adjustment of the mentally retarded have noted that IQ is not a strong predictor of later adjustment in the community; furthermore IQ is not related to vocational adjustment. (These findings are restricted to persons in the mild, and to a lesser extent, moderate, ranges of retardation; community and vocational adjustment become considerably less likely as one moves down to the severe ranges.) Instead, many researchers have documented the role of personal and social adjustment skills and personality in adjustment to the community and to a job (Davies & Ecob, 1959;

## Table 2-6

## LIFE FUNCTION TABLE-MENTAL RETARDATION: SOCIAL-ATTITUDINAL

| Statement of Problem | Dynamics | Source |
|---|---|---|
| Major deficits that inhibit the socialization of the retarded: | | |
| Lowered Self-Esteem | | Green & Zigler (1962)<br>Turner & Zigler ('64) |
| Acquiescence or conformity | | Zigler et al. ('58)<br>Robinson & Robinson |
| Conditioned helplessness | | Cantor (1963)<br>Berkson (1963) |
| Socially inappropriate behavior | | Garfield (1963)<br>Clark et al (1968) |
| Sexual inadequacies | | Conley (1971) |
| Psychiatric handicaps | | |
| Limited contact with members of the opposite sex. | For those whose IQs are below 55, 80% report no contact. No more than 50% of those living independently reported any contact. | Bell (1974) |
| Lack of friendships with other community members. | 31% of those with IQ of 55 or higher reported no visits to their home, 20% have never been invited to homes of others. 48% of those with IQs of less than 55 have had no visitors and 47% of them have not been invited to the homes of other members of the community. | Bell (1974) |
| Limited participation in social organizations. | 59% of those with IQs of 55 or higher, 76% of those with IQs of less than 55. | Bell (1974) |
| Retardate expects to fail. | | McMillan & Keogh (1974) |
| Behavior problems involving jeopardy to health & safety. | 424 community placed retarded committed 1253 incidents of problem behaviors; 77% involved jeopardy to health or safety; 4% to general welfare; 18% legal jeopardy. 79% of these incidents resulted in jeopardy to the client, 12% to a fellow client and 9% to other members of the community. | Nihira & Nihira (1975) |
| Behavior problems jeopardizing general welfare | | |
| Behavior problems involving legal jeopardy | | |

| Statement of Problem | Dynamics | Source |
|---|---|---|
| Lack of sexual knowledge | Clients with mental or borderline intellectual limitation | Clark et al. (1968) |
| Lower achievement motivation | Retarded children have lower achievement motivation than normals. | Jordan & DeCharma (1959) |
| Criminal behavior | 9.5% | Courtless & Brown (1967) |
| High divorce rate | 24% of the men; 30% of the women | Baller, Charles & Miller, (1967) |
| Anxiety | | Zigler & Harter (1969)<br>Berkson (1963)<br>Cantor (1963) |
| Dependency on cues from others | Among institutionalized | Green & Zigler (1962)<br>Turnure & Zigler (1964) |
| Fear of failure | Avoiding failure rather than seeking success | Cromwell (1963)<br>Jordan & DeCharms (1959) |
| Lowered expectancy of success | | Robinson & Robinson (1965) |
| Satisfaction with low degrees of success | | Stevenson & Zigler (1958) |

Penrose, 1963; Sarason, 1953; Tizard, 1953). Conley (1973) estimates that 40% of the retarded have psychiatric handicaps. According to Robinson and Robinson (1965),

> Success in obtaining and keeping a job is related to a large number of psychological and work-habit variables, including initiative, self-confidence, co-operation, cheerfulness, social mixing with other employees, respect for the supervisor, and understanding and efficiency in work (p. 545).

A great deal of attention has been given to social-attitudinal deficits in the institutionalized retarded which presumably relate to a lack of social stimulation and a subculture which is in many ways unlike that of society at large in terms of social norms.

Rosen, Floor, and Baxter (1972) categorize some of the major areas of deficits as follows:

1. Lowered self-esteem and related motivational deficits--e.g., avoiding failure rather than seeking success (Cromwell, 1963; Jordan & DeCharms, 1959), lowered expectancies of success (Robinson & Robinson, 1965), and a willingness to settle for lower degrees of success (Stevenson & Zigler, 1958). Furthermore, the retarded often rely on external cues rather than on their own abilities and are unusually responsive to social information and reinforcement from adults (Green & Zigler, 1962; Turnure & Zigler, 1964; Zigler et al., 1958).

2. Acquiescence or conformity--also related to reliance on other in problem-solving and responsivity to adult reinforcement.

3. Conditioned helplessness--as a function of institutional life and the lack of relationship between one's own efforts and the extent to which one's needs are met.

4. Socially inappropriate behavior--due to incomplete learning of social norms and at times to staff reinforcement of behaviors unacceptable

outside the institution.

5. Sexual inadquacies--due to lack of opportunity to develop appropriate behaviors. Research at the Elwyn Institute indicated that one-third of discharged females had severe sex-related crises--pregnancy, eviction from an apartment due to promiscuity, etc. (The double standard lives.)

In another review of the social adjustment of the retarded, Zigler & Harter (1969) emphasize anxiety as well, as documented by Berkson (1963), Cantor (1963(, Garfield (1963), Spradlin (1963), and Stevenson (1963).

## VI. Functioning as a Member of Society

The literature provides information about the mentally retarded in the labor force and the community.

### Functioning as a Member of the Labor Force

The extent to which the mentally retarded participate in the work force is qualified by the magnitude of their retardation, the degree of family or community support and the retarded person's willingness to adapt to the demands of either sheltered or competitive employment. Cassell (1976) estimates that persons with IQs between 70-80 can expect to be employed at menial tasks, during both "good or poor economic times" and with only minimum supervision; indeed they might even aid in supervision. He further states that those with IQs between 60-70 can expect a similar rate of employment as those in the 70-80 range without the supervisory capabilities. Persons with Iqs between 55-60 can contemplate employment only in the best of economic times and then only under constant and immediate supervision. As for those who fall in the 50-55 category, the prospect for employment is only feasible under "quite reduced standards" and then only if accompanied by immediate supervision. Although 45% of the adult males and 12% of the adult females with IQs between 45-50 are employed, most often they are found to be working in "terminal sheltered workshops at best, or in custodial institutions at worst (Wagner & Hawver, 1967).

Studies conducted by Dinger (1961), Tobias et al. (1969), Saenger (1957) and Mullen (1952) lead to the rather general conclusions that mildly or severely retarded females have higher unemployment rates than their male counterparts; retarded blacks are more often unemployed and more poorly paid than retarded whites, and finally retarded black females enjoy higher rates of employment than white or Puerto Ricans. Conley (1973) concluded that 87% of the mildly retarded males and 33% of the retarded females have been employed at one time or another. Those percentages are 4% and 12% below the norm for the non-retarded and their earnings are slightly above 85% of that which the non-retarded receive for similar work.

The foregoing studies have demonstrated that there are a large number of mentally retarded persons with varying degrees of retardation in the work force. The extent and quality of their contribution can be improved by two factors; special training for the retarded, and an increased awareness of their capabilities by employers in the public and private sectors.

An example of the impact of vocational rehabilitation on the life of the MR can be documented by a report issued by the Texas Rehabilitation Commission (Whitcraft, 1974)

| Earnings at Referral | Earnings at Closure | | | |
|---|---|---|---|---|
| | $0 | $1-50 | $51-100 | $101- |
| 0 | 13% | 23% | 58% | 6% |
| $1-50 | 5% | 22% | 64% | 8% |
| $51-100 | 5% | 3% | 81% | 11% |
| $100-highest | 14% | 7% | 43% | 36% |

Teaching particular job skills may not be the most important feature of the sheltered workshop. Rather, the imparting to the student the importance of being able to adapt to and get along with his fellow workers may be the most important aspect of a school's curriculum (Neuhaus, 1967; Baxter, et al., 1969). Surveys conducted in Kentucky, Tennessee, Massachusetts, Illinois and Louisiana all concluded that workshops that taught both job skills and work attitudes were far more successful in placing students in competitive employment (Mental Retardation Abstracts #2774, 2775, 2777, 2778, 2779).

Employers in the private sector are realizing the advantage of hiring the mentally retarded, particularly for low skilled jobs that have a high turnover rate. Of sixty retarded workers hired by Remco Industries, forty qualified for permanent employment, (Conniff, 1961) and of 103 retardates hired by the W.T. Grant Company, only three were let go for poor work performance. The same company would have hired even more except that many of their managers had not been approached by any professional agency (The President's Committee on Employment of the Handicapped, 1968).

In 1964 a program was initiated to employ the mentally retarded in various federal employment areas. It was not to be sheltered workshop employment, but rather routine, repetitive work that it was hoped could be performed by the mentally retarded. In all, 1747 mentally retarded workers were hired between the years 1964-1966 and in 1968 Oswald conducted a survey to review their perofrmance. The majority of the sample were males (CA 20-25, mean IQ 72.9) and they performed 100 jobs in the following categories; 48% wage board, 31% clerical and 21% postal service. Of the 62% still employed in 1968, 40% had changed to jobs to a higher pay scale and only 9% of those employed at any time were dismissed for poor performance

(Oswald, 1968; Macy, 1966).

Hansen (1969) noted that if legislative changes are affected in civil service requirements, even the severely retarded could be employed on the state, city or county level. He employed some severely retarded workers and put them to work, under volunteer supervisors, cleaning up recreation areas and the results were highly satisfactory.

Automation, which it was feared would do away with many of the jobs that the retarded now perform, may instead be a boon to the hiring of even more of the mildly retarded. The essence of assembly line work is to telescope previously complicated tasks into simple, repetitious maneuvers, thereby broadening the participating possibilities of the retarded (Conley, 1973). This same procedure would allow for upward mobility for the non-retarded, consequently eliminating the competitive factor for the retarded. Russell Nixon (1969) stated that "existing evidence is overwhelming that technological change is not changing worker requirements in such a way as to significantly reduce the opportunities for successful vocational rehabilitation of the mentally retarded."

## Functioning as a Member of the Community

Mental retardation may occur in any family, regardless of its social strata, intellectual level, religious affiliation, race, or other distinguishing characteristics (Conley, 1973, p. 2). It affects almost six million people and for the retardate and his family it is a life time encumberance. Identification can be certain at birth or reluctantly accepted when the child reaches the age of either seven or eight (Robinson & Robinson, 1965). It is at the point of acceptance when the effect of mental retardation on the child, the family and the community begins.

For most families, at one point in their relationship, the decision on how to accommodate the disability must be dealt with, i.e., should the child be cared for at home, or is his condition so intolerable that the only feasible course would be institutionalization? Saenger (1960) in a study conducted in New York State, discovered that 88% of those whose IQ below 20 are certain to be institutionalized while only 10% of those whose IQ is between 50-60 are similarly treated. Additional factors that influence the decision to institutionalize are ethnic background, behavioral patterns, family characteristics, and economic conditions. In that same study Saenger found that 1 out of 2 Puerto Ricans, 1 out of 4 blacks, 1 out of 10 Protestant or Catholic whites and 1 out of 20 Jewish mental retardates were institutionalized. Another finding was that when those with IQs above 50 were placed in a more structured environment, it was usually because of troubles arising outside of the home (usually deviant sexual behavior), while those with IQs below 50 were institutionalized because of problem behaviors within the home.

Regardless of the outcome of the decision to institutionalize or not, the effect of mental retardation on the family is a continuing burden. If the option is for custodial care, the parents may be guilt ridden and tend to idealize the child. In some instances this idealization can lead to conflicts with school officials over the manner in which the child's habilitation is carried out. Another quite opposite reaction stemming from the same guilt feelings is abandonment of the child by his parents (Saenger, 1960).

The decision to care for the child outside of the home has mixed effects on the retarded child's siblings. A brother of the institutionalized child might suddenly find his relationship with other members of the family deteriorating. On the other hand, a sister, relieved of the constant demands of caring for a retarded sibling, may very well find her life style altered and flourishing (Farber & Jenne, 1963).

If the child is kept at home, the parents of the retarded child "have little to look forward to--they will always be burdened by the child's unrelenting demands and unabated dependency" (Olshansky, 1962). At the same time, the siblings of the retarded child may feel shame and apprehension over their own marriage prospects, fear of peer rejection, and concern that eventually they will have to assume the physical and economic burden of caring for the retarded child (Olshansky, 1962).

Miller (1969) in "Seven stages in the life cycle of a family with a retarded child," described the intra-family conflicts arising out of the discovery of a retarded child. He found that the child, by usurping most of the mother's attention, threatened the husband-wife union, disrupted the family balance and severely limited the social and personal life of the parents. Jacobs (1969) found that the child's relationship with the father was distorted, the father being overprotective, secretive, and less able to accept the diagnosis, while the mother perceived the child as a binding influence on the family. In spite of the child's almost divisive impact on the family, Wolfensberger (1967), found that the marital difficulties that ensued seldom led to divorce. In support of that statement, Graliker and Koch (1965) reported that in a survey of 69 families only 16 had extraordinary marital problems and only two of these ended in the dissolution of the marriage.

As trying as it is for the family of the retarded, their burden is light compared to the plight of the retarded person himself. Baller (1935) found that the retarded lead "lives of frustration, rejection and isolation that lead to bitterness, fearfulness and irrascibility." Thirty-two years later, Wolfensberger (1967) found that 23 of 44 adolescents had essentially "no social contact, activities or interests." This leads some researchers to theorize that these experiences lead to criminal activity. For example, Goldstein (1964) reports that 9% of all prison inmates are mentally retarded.

Peterson (1961) selecting a group of 45 mentally retarded adults, found 62% of those sampled had been involved in some form of criminal activity. Not only are they more frequently engaged in some kind of criminal activity, but more often they are of a violent nature. Allen (1968) found that 39% of the crimes committed by retarded prisoners are significantly more serious than those committed by other prisoners, and Lerry (1954) in a study of crimes committed by Washington State prisoners found that 59% of the retarded had committed violent crimes as compared to 18% of the non-retarded prisoners. The aforementioned studies deal in the main with the moderate or mildly retarded men. It should be mentioned, however, that other researchers cite evidence to negate the "criminal activity theory." Saenger (1957) found that of those with IQs below 50, only 5% have had adverse contact with the police. As for the female retardate, the assessment of their criminal activity fluctuates. In a study covering the years between 1951 and 1962, Baller, Charles, and Miller (1967) found that none of the female retardates included in the study committed civil offenses versus 4% of the females in the control group. Kennedy (1962) in a similar study covering the years between 1948 and 1960 discovered that 7% of the retarded were arrested versus 2% of the female control group.

In respect to other aspects of their life style, 75% of the men and 60% of the women marry and experience an almost identical procreation rate as did the control group (Kennedy, 1962). The retarded are 2½ times more likely to have children with IQs below 75 and 4 times as likely to have a child with an IQ below 90. "Similarly, the proportion of children of retarded parents who fail to advance one grade per year was twice as high as among the children of the control group" (32.5% versus 11.8%) (Conley, 1973, p.236).

In reference to the incidence of divorce among retardates, studies are in conflict. Kennedy (1962) found that the retarded are less likely to have been divorced while Baller, Charles and Miller (1964) found that 24% of the men and 30% of the women had been divorced. Conley (1973) feels that the discrepancy between these two studies might be caused by the high percentage of Roman Catholics contained in the Kennedy group.

There are a host of studies that document the adaptability of many of those who are stricken by mental retardation. Saenger (1957), in a random sample of 520 out of 2640 severely handicapped adults who were discharged from institutions between 1929 and 1955, found that many were leading "happy and useful lives, satisfying to both themselves and to their families". Bijou et al. (1943) documented that mildly retarded adults were capable to blending into the society and leading productive lives (out of 101 girls, 70 were average or better in adjustment). Charles (1953) in a study conducted on 151 formerly institutionalized pupils, all with IQs below 70, found that 80% were married and 83% were self-supporting.

It is clear from these and other studies that education, either in custodial institutions or in the more normal school setting, can enable even the severely retarded to lead useful and satisfying lives and for the mildly retarded to be partially or wholly self-supporting.

## VII. Technologies

The primary technologies applied to the rehabilitation of the mentally retarded have been in the training/counseling, and environmental change areas, i.e. non-physical intervention technologies. The technologies fall roughly into seven broad categories:

1. Prevention
2. Identification
3. Education
4. Residential/Living Arrangements
5. Vocational Training
6. Recreation
7. Advocacy/Legal Rights

The following descriptions of technologies is not meant to be exhaustive by any means. An attempt has been made to present representative programs and techniques in each of the seven broad areas.

### Prevention/Early Identification

There have been a large number of technologies applied in the area of prevention and early identification of mental retardation. These have arisen in the last 10-15 years, for the most part, as knowledge about some of the preventable causes of mental retardation has been gathered, and because of research showing that the earlier in a child's life that remediation and treatment begin, the greater the likelihood is of ameliorating conditions which could not be prevented later in life.

The following is a brief description of some of the technologies which have been applied in this area. The list is by no means exhaustive, but it does provide an overview of the types of causes of mental retardation which have been identified, and hopefully are avoidable. This information is adapted from the report of the President's Committee on Mental Retardation, (February, 1975).

## Preconception

Genetic assessment and genetic counseling to determine potential chromosomal-genetic risks in pregnancy. Genetic counseling is a recent approach to prevention of mental retardation as well as related birth defects. Chromosomal analysis and intensive family histories can help to determine if either parent carries abnormal genes, or if both parents may possess recessive genes which could lead to risk of a defective infant.

## During Pregnancy

A larger number of defects can be identified during pregnancy through amniocentesis. While the procedure was developed in the late 1800's, it has had extensive use only in the last ten years. The procedure involves inserting a needle into the amniotic sac that contains the fetus and withdrawing a small amount of amnionic fluid. Fetal cells in the fluid are then analyzed to determine the chromosomal makeup of the fetus. About 60 genetic-metabolic errors can be diagnosed by this procedure. Below is a partial list of mental retardation causing or related disorders which can be detected by amniocentesis:

A. Down's Syndrome
B. Tay-Sachs disease
C. Maple Sugar Urine disease
D. Gongliosidosis
E. Hurlers Syndrome
F. Glycogen Storage disease
G. Sanfilippo Syndrome

H. Lesch-Nyhan Syndrome

I. Galactosemia

Genetic counseling and testing of parents prior to conception, and prenatal amniocentesis can provide estimates of the risk of having a retarded child, or can confirm the presence or absence of a defective fetus. If it is found that the parents are at high risk of having a genetically defective fetus, or if a defective fetus is identified, the parents may elect, in the first instance, not to have a child, or in the second instance, to terminate the pregnancy. As of March, 1974, there were 274 centers across the United States providing genetic counseling, and amniocentesis is widely available through most obstetritions. Another major factor during pregnancy is maternal nutrition and avoidance of defect causing drugs and toxic agents.

## At Delivery

Rh Incompatability. Early identification and treatment of mothers with Rh incompatibility with a first child can prevent the formation of antibodies which can lead to erythroblastosis fetalis in second and third children. It was estimated that in 1970, 20,000 infants were affected by diseases stemming from Rh incompatibilies. It has been found that injections of Rh gamma globulin are most effective in preventing erythroblastosis in later children. Post natal injections prevent initial sensitization of Rh incompatible mothers, and the later formation of antibodies which destroy the red blood cells of later children.

PKU. Mental retardation due to phenylketonuria (PKU) results from an inborn metabolic error which results in 20 to 30 times the normal concentration of the amino acid phenylalanine in the blood which intoxicates the brain. It can be screened by a simple test of the infant's urine and treated with a low phenylalanine diet. Approximately one in every 14,000 live births is PKU sensitive, and untreated, the condition leads to a degeneration in intellectual functioning (Woolf, 1970).

The desireability of early screening was first recognized in 1956 (Woolfe, 1970). According to the latest available data (1970) 69% of newborns four days old or younger were screened for PKU (Cunningham, 1971; Holtzmann, 1974). Recent evidence reported by Woolf indicates that though boys and girls are equally likely to have PKU, boys are detected more often. It probably takes longer for the concentration in the blood to rise in girls, suggesting the need for a second screening at age 2-3 weeks. The screening can be done in hospitals or a public health nurse can visit the home. In some states, screening is mandatory but in others hospitals cooperate on a voluntary basis.

There is firm evidence that PKU treatment prevents the deterioration in IQ characteristic of untreated cases; however, the mean IQ of the treated group is 20 to 25 points lower than the mean for unaffected siblings. Furthermore, there are some risk factors during treatment--the concentration of phenylalanine can rise due to diet breaking or infection, or drop dangerously low. The low concentration is physically dangerous and may lead to intellectual impairment according to some (Woolf, 1970).

Treatment is often terminated when the child starts school and sometimes earlier because mothers find it difficult to maintain. Evidence suggests that school performance and IQ may deteriorate gradually after treatment is stopped in some cases, suggesting the need for continued monitoring for brain damage.

According to Woolf (1970), at a cost for screening of $1.25 per infant, screening of all newborns in the U.S. would cost about $4,500,000 to detect roughly 300 cases, of whom 200 would have the problematic type of PKU. This would amount to $25,000 per case detected. Treatment would add $1,700 per patient for each year of treatment--for example, $10,000 spread over 6 years or $100,000 for life-long treatment. This may be compared to institutionalization at $2,000 per year for 60 years or $120,000 per patient, to which may be added $270,000 in productive capacity gained by society for each case treated.

Meier (1973) offers a different calculus.

> Ignoring for the moment the humane issues involved with PKU screening, consider the economic benefits. Discontinuance of PKU screening would represent not merely medical but also fiscal irresponsibility of the grossest sort. The detection and treatment of one case of PKU represents an outlay (assuming it is the outcome of 10,000 screening tests, each costing 50¢ to $4.00 in the U.S.) of up to $50,000; but failure to detect that case means a child that must almost certainly be institutionalized for the rest of its life, representing an outlay of at least $250,000 (this assumes an average life span of 50 years and an annual expenditure for custodial care conservatively estimatable at $5,000). The $250,000 figure includes no allowance for the future earnings of the treated case, or of the tax income from such earnings. It does not allow for the suffering experienced by the parents of a permanently retarded child--which is not, in any case, quantifiable in terms that are likely to make sense to a budgeter. We are not talking here about human values but purely economic ones: whether it is better to spend $50,000 now or five times that sum later.[2]

Early recognition of the possibility of premature birth, and efforts to prolong the gestation period have led to a reduction of retardation due to prematurity and low birth weight, factors which present serious threats to a favorable prognosis for the child.

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[2] J. Meier, Screening and Assessment of Young Children of Developmental Risk (Washington, D.C.: PCMR, 1973), p. 35.

## Early Childhood

Additional factors included in early childhood include:

A. Rubella-vaccination-early childhood is the safest time for rubella vaccination, but it can be accomplished any time prior to child bearing age. The risk of mental retardation to children with congenital rubella (children born to mothers having rubella during pregnancy) is very high (over 50% to mothers contracting rubella in the first trimester). The best prevention is early vaccination of children.

B. Childhood malnutrition is highly related to mental retardation. Although there is no firm evidence that it causes retardation by itself, there is good reason to believe that it may.

C. There is no doubt that lead poisoning will lead to fatalities if ingested in sufficient quantities. The long term effects of ingestion of smaller amounts of lead is not firmly established, but it is known that lead poisoning causes irreversible brain damage in non-fatal cases.

The report of the President's Committee on Mental Retardation (1975) gives the following statistics:

> "·In a survey of 14 Illinois communities more than one in six children ages one through six, from all socio-economic levels, had elevated blood lead levels. Fifty-one of the 6,100 children studied had definite cases of lead poisoning.

- A recent report from Boston showed that in certain neighborhoods which receive their water through lead pipes, there are noticeable quantities of lead in the drinking water supply.

There is conclusive proof that lead poisoning is a major health hazard in urban areas.

- During a four month screening period in 1972, about 50% of newly screened children in Washington, D.C.'s lead poisoning screening program, based at Children's Hospital, had blood lead levels in the abnormal range.

The second major focus in prevention of mental retardation is programs aimed at alleviating or eliminating the conditions which may lead to or contribute to the type of mental retardation known as cultural-familial retardation, an etiological category which accounts for from 75% to 96% of the mental retardation in the U.S. today. These programs are based on the assumption that cultural-familial retardation is an acquired characteristic and therefore avoidable or ameliorable. Probably the best known of these programs is that known as the Milwaukee Project, an early identification and intervention project which is described below.

The Milwaukee Project (Heber, Garber, Harrington, Hoffman, & Falender, 1972) is a longitudinal study concerned with families who are at "high risk" of having retarded children. Initially, the project conducted surveys which indicated that the high prevalence of mental retardation occurring in the slums of American cities is not randomly distributed but is primarily contained in families in which the intelligence of the mother is subnormal. Once the "high risk" population had been identified, the investigators set about developing methods to reduce the risk of retardation in children of families with low maternal intelligence.

Adult women (with a measured WAIS IQ below 75) with a newborn child were assigned to either a control group or a comprehensive family stimulation program. Mothers received rehabilitation training including (1) remedial academic education (2) vocational information and counseling (3) occupational training and (4) general counseling. The infants of the family in this program were enrolled in a preventive regimen which included a carefully individualized prescribed curriculum to facilitate intellectual, academic, and social development. Results so far have shown that the children in the experimental program are superior in all measures of development as compared to the control group. Most remarkable is the development of a stable differential performance between the two groups to the extent of nearly 30 IQ points in favor of the experimental group. The monitoring of these children is continuing, along with an extensive program to discover information about home life that can suggest new intra- and extra-familial educational programs for children coming from such disadvantaged backgrounds. In addition, efforts directed toward the rehabilitation of the mothers, both in terms of developing job or employment skills and toward improving home management skills, have borne fruit. A number of these mothers have found gainful employment while others have shown substantial changes in homemaking skills. Extensive post-project follow-up evaluations are planned and are being implemented at the present time.

## Education

The special class in a neighborhood public school has been the most popular and highly recommended arrangement for the majority of mentally retarded children. In the United States, the first classes in public school were organized in 1896. The growth of these classes since that date has been steady.

ENROLLMENT IN SPECIAL CLASSES
1922-1958

1922 ------------- 23,252
1927 ------------- 51,814
1932 ------------- 75,099
1936 ------------- 99,961
1940 ------------- 98,416
1952 ------------- 113,962
1958 ------------- 196,785

(according to Biennial Survey of the U.S. Office of Education)

Often several classes were placed in one school so that the children could be grouped homogeneously according to age and mental ability. One estimate suggests that special classes now serve 50% of the children needing some form of special education Schwarz, (1975).

Recently, special education needs have been expanded with the introduction of "zero rejection" laws which demand that the schools serve all handicapped persons, including severely and multiply handicapped retarded persons previously rejected.

Recently there has been an increasing trend to place retarded children in regular grades in order that they experience positive interactions with non-handicapped learners. It has been noted (Gjessing, 1972) that the development of teaching in regular classrooms seems to be constantly moving in the direction of increased cooperation and mutual support amongst learners. Rister & Mefford (1973) point out that the presence of retarded children in the public schools can bring out in normal children more expressions of positive concern and sympathy for less fortunate human beings. Similarly, Christopolos & Renz (1969) have stated that the inclusion of retarded children in regular classrooms should humanize the attitudes of the normal children. It is the unfamiliarity that breeds fear and contempt.

Some of the central arguments for and against integration have been summarized by Gjessing (1967). Supporters of integration have claimed:

1. that it is a very serious encroachment to take a child out of his or her natural school context and circle of friends, and in some cases even from home;

2. that preliminary research shows that children with learning difficulties are unlikely to achieve more success in school in a special class than in a regular class;

3. that regular schools have become so enlightened, both in educational approach and attitude, that they may accommodate children with far more serious learning difficulties than has been the case up to now;

Conversely, those opposed to integration maintain

1. that children with learning difficulties will, if they are subjected to the demands of regular school, be exposed to a continuous, harmful pressure which will make them feel that they are failures, and which will lead to frustration;

2. that children with learning handicaps will, as a result of organizational differentiation, be in a situation where they can receive teaching and treatment much more suitable to their real needs than regular school instruction can be;

3. that children with learning difficulties need to be supervised by teachers who are trained for special education tasks;

4. that these children usually have compound handicaps which need to be treated by a combined professional team and therefore these facilities need to be concentrated in special schools.

Research in this area has produced ambiguous results as most studies have been unable to control all factors involved:

1. Selection factor in assignment of children to special or regular grades,

2. Attendance in regular classes before attending special classes,

3. no clear-cut delineation of a special class, the curriculum or qualifications of special teachers,

4. reliability and validity of measuring instruments.

Several studies (Cassidy & Stanton, 1959; Elenbogen, 1957; Thurstone, 1959) have shown that the academic achievement of retarded children in regular grades was either superior or equal to those in special classes, but their social adjustment as rated by teachers was lower than special class students. Johnson (1950) has demonstrated that the mentally retarded children in regular classes tended to be isolated and rejected by other children in the classes. Several other studies have obtained similar results (Johnson & Kirk, 1950; Baldwin, 1958).

Recently Haring & Krug (1975) developed an individualized instruction program to facilitate the return of special education students to regular classes. The project used Distar & Sullivan Programmed Reading Series and a token reinforcement system; academic performance was recorded daily for every academic subject. Results showed that a high percentage of the students who participated could acquire basic skills at a rate to allow regular class placement. Once placed, these students maintained their academic and behavioral adjustments. Furthermore teachers rated these students as highly adaptable socially. They concluded that there are a high number of children in special education classes who are capable of making normal growth in regular programs and that in order to successfully mainstream these children we must academically and socially prepare them.

Dr. J.W. Birch at a recent conference on mainstreaming concluded the following: (See Jordan, 1974):

1. A school tends to become a more child-centered community when mainstreaming is implemented.

2. Instruction is individualized for more regular class pupils when mainstreaming occurs.

3. Mainstreaming helps in the more meaningful involvement of large number of parents in school activities.

4. Progressive inclusion is a process which provides a workable approach to the accomplishment of mainstreaming.

5. Trade-off is an established part of the dynamic relationship between regular and special education teachers. It results in help for all children who need some attention, whether identified as belonging in special education programs or not.

6. Open spaced school arrangements were felt to be conducive to more successful mainstreaming.

7. Program implementation should begin slowly and carefully.

8. Mainstreaming may be difficult but it certainly is possible.

9. It is not yet proven to be the most appropriate way of organizing for instruction.

The integration of thousands of TMRs and TSMRs can decrease unnecessary spending on institutionalization of those who do not require it. Normalization and ultimate independent existence can relieve taxpayers from maintenance costs for many who would otherwise be life-long dependents on the state (Risler & Mefford, 1973). It will cost money to instruct regular teachers--provide them with assistance and material. The cost of establishing and operating special programs to aid transition into regular classes, or decreasing special programs once students are in regular classes, must be considered.

Residential/Living Arrangements

Group homes and family care homes are small residential treatment and training units for mentally retarded persons who are presently or potentially capable of functioning in the community with some degree of independence. They can be bought, furnished and operated by an institution, community mental health and mental retardation center, or voluntary agency; they can be rented; or they can be operated in ordinary homes through contracts between an agency and a couple who then takes in one or more retarded persons. Although licensing requirements sometimes dictate special fire alarm systems and safety provisions for the handicapped, a group or family care home is designed or arranged, first and foremost, as a homelike environment, in keeping with the principle of normalization (Wolfensberger, 1972) which calls for culturally normal environments and lifestyles for the mentally retarded. To facilitate integration in the community, group homes are typically established in residential neighborhoods, preferably close to public transportation, stores, recreation, and other community resources. Although some homes operate essentially as room and board facilities or as natural homes, others are supplemented by more formal training programs which aim at enlarging the resident's repertoire of community living skills.

Group homes represent an environmental change technology in the sense that in the past living options for the mentally retarded were largely residential to either a large institution or the person's natural home. Group homes have been offered as a technology to permit deinstitutionalization to occur and to prevent unnecessary institutionalization. The President's Committee on Mental Retardation set as one of its goals in 1971 "to return one-third of the retarded now living in institutions to community living."

In a report on a national mail survey conducted in 1972, O'Connor and Sitkei (1973), working with a definition of group homes which specifies six or more residents, identified 474 homes in the country and were alerted to more than a hundred new homes in the course of data gathering. Almost half of the homes identified had opened within the last two years. Although homes served the whole age range, homes for yound adults were most prevalent. Children are more typically served in smaller foster-family care homes which are more numerous than group homes. Although special state and federal funds have facilitated the development of group homes, it is more difficult to obtain funds for continued operation, particularly for relatively expensive homes which stress resident training. Supplemental Security Income benefits of $146 per person, sometimes supplemented by a state, offer some promise, as do rent subsidies through the Housing and Community Development Act of 1974.

Virtually no data are available to indicate that group homes have a positive impact on residents. There are, however, several pieces of research pointing to the negative effects of institutionalization (Butterfield, 1970). Research by Tizard (1970) and others in Britain is relevant, for in looking at organizational structures of different facilities in relationship to the progress of severely retarded children, child-oriented, homelike organizational structures achieved through small cottages were more beneficial than a ward or hospital structure in terms of the intellectual, social, and emotional development of residents. Many studies have pointed to the benefits of foster care placement, particularly early in life, over continued institutionalization. Yaron (1974) in one of the few studies of the effects of group homes in America, found significant gains over a five to 21 month period for 44 adults placed in eight group homes. Clients from an institution scored lower ar pre- and post-test than clients from the community, but they progressed as rapidly as those from the community.

Small living units geographically dispersed are presumed to permit the use of community resources and facilitate integration into the community more so than the isolted institution. Furthermore, employment opportunities are increased due to closer physical proximity to jobs (Conley, 1973).

Finally, it may be added that group and family care placements have contributed to deinstitutionalization. Although only approximately 200,000 to 300,000 of the mentally retarded in the U.S. are placed in institutions, the enrollment in most institutions has declined in the last few years, though the decrease is not as large as the one-third reduction called for by the President's Committee on Mental Retardation. Group homes have primarily led to the deinstitutionalization of borderline and mildly retarded adults.

Ronald Conley (1973) estimates that approximately 240,000 retarded adults, most of them in the moderate range of retardation, would potentially benefit from group homes--45,000 from institutions and 195,000 now living in the community. He also argues the economic case for small community based homes: "Potentially, the social benefits are substantial, ranging to as high as $8,000 per person if we consider both productivity and savings in the cost of institutional care." Although it is in many ways cheaper to manage larger institutions than smaller ones, Conley argues that small community-based facilities would permit purchases of services from community resources at a lower cost than they can be produced by an institution.

One commonly quoted figure suggests that group home care may cost half what institutional care costs. However, such estimates do not always take into account the cost of services received in the community which were formerly provided by the institution. Conley set the cost per resident of institutional care at $5,865 per year or approximately $16 per day in 1970 but the costs have increased since as a function of inflation. Room and board facilities with little formal training can probably be operated for $6.00 to $10.00 per resident per day, but training hostels staffed with qualified trainers have been found to cost more like $15.00 to $20.00 per day, often approaching the costs of institutionalization. However, there are no data suggesting that community facilities equal or surpass institutional care in cost, so the savings should tend to be between 10% and 50% of the cost of institutionalization. These figures, of course, do not include the savings to the taxpayer and contribution to the economy of converting a previously unemployed person into a wage-earner.

## Vocational Training

Recent legislation has mandated that vocational rehabilitation services be extended to the more severely retarded client. In trying to meet this demand, work training programs, especially sheltered workshops, are having considerable difficulty. Lack of resources and utilizable techniques, present operating procedures and low expectations contribute to a lack of programmatic development in work programs for severely retarded clients (Martin & Flexer, 1975).

Early research and demonstration programs showed some of the difficulties encountered in early efforts to develop work programs for the severely retarded. Tobias and Cortazzo (1963) established a work program parallel to a sheltered workshop because the moderately and severely retarded adults "were considered infeasible for vocational rehabilitation either in competitive industry or in a sheltered workshop" (Page 25). The expectation was that the more severely retarded student could not be trained to produce quality work at sufficient rates to function in sheltered work programs.

Another program (Blue 1964) reported several problems encountered when trainable level students were placed in a sheltered workshop setting. Due to production deadlines and untrained staff, little time was spent in adjustment training activities. With only one major contract, the trainable students were relegated to a very simple repetitive part of the task and after some time became very "bored" with their job. The result was a reduction in the trainable groups' productivity. The greatest problem which Blue reported, however, was the low expectation of performance from this group on the part of professionals and parents.

Today, the availability of suitable work training programs for the severely retarded client are about the same as ten years ago. Because of a lack of training programs, the severely retarded client is placed in a program where he is not expected to be competitively productive.

However, evidence has been accumulating to indicate that the vocational level of the severely retarded client can be raised considerably (at least to sheltered workshop level). Techniques of programming work environments have been developed and have demonstrated that the severely retarded can perform complex work tasks and can produce work at high rates. When used in the context of sheltered workshops, these techniques of programming of the work environment are manifested in a combination of learning principles and prosthetic modifications of the work environment (Karen, Eisner, & Endres, 1974).

Some studies focused on the acquisition of difficult discriminations and motor movements for completion of work tasks with long sequences of steps. With intensive programming of the task environment, severely retarded persons have:

1) assembled relay panels (Tate & Baroff, 1967)
2) operated drill presses (Crosson, 1969)
3) assembled bicycle brakes (Gold, 1972)
4) assembled cam switch actuators (Bellamy, Peterson & Close, 1975).

The retarded persons' acquisition rate of the behaviors to perform these complex tasks was remarkably short (the longest being about 6-8 hours reported by Bellamy, et.al., 1975). Gold (1975) reported that the retention rate of subjects in his study over five years time was almost 100%, and Crosson (1969) found almost 100% retention at two and twelve months for the severely retarded persons in his study.

Other studies show an increase in the level of productivity of severely retarded clients through the application of operant techniques in sheltered work programs. Zimmerman, Stuckey, Garlick, and Miller (1969) studied the effects of token reinforcement on the productivity of sixteen multiply handicapped clients who had poor prognosis for productive employment or had failed in previous workshop experiences. Clients were reinforced daily with tokens according to the percent of baseline productivity which was achieved. The average number of units per hour on an assembly task was significantly higher than baseline when the group received redeemably tokens for productivity. Fourteen of the sixteen clients improved in productivity from baseline to treatment, indicating that the reinforcement program was effective with almost all clients.

An automated workshop system to motivate and maintain effective work and work-related behaviors for the severely retarded adult was developed by Screven, Straka, and Lafond (1971). In an experimental workshop, varying reinforcement schedules were studied in relation to productivity and related work behaviors in an effort to determine the optimal schedule and types of reinforcement for particular clients. Some results and tentative conclusions included the following:

1) Severely retarded clients, formerly excluded from workshop activities of even low level, worked for a normal workshop day and produced goods of acceptable quality at a rate comparable to regular workshop clients with greater day to day stability.
2) There were sizable differences between clients in the ratio of units produced to reinforcement that would maintain smooth performance.
3) Accompanying steady work output was the reduction of disruptive behavior.

Other studies (Trybus & Lacks, 1972 and Karen, Eisner & Endres, 1974) demonstrated the effectiveness of a token system in increasing the productivity of severely retarded clients and in reducing the frequency of inappropriate behaviors. However, Karen, et.al. (1974) found that visual-inattendance, (not attending to the task), decreased irrespective of the tokens while

Trybus and Lacks (1972) reported that 40% of the clients at follow-up were not able to succeed in a sheltered workshop. Perhaps, programs which are directed at more stable change in clients' behavior (not too dependent on intensively programmed environments) should be attempted.

The behavioral technology available has been demonstrated to be effective in raising the vocational level of the severely retarded, but the problem still remains that the technology has not reached the level of the rehabilitation practitioner to any extensive degree. Demonstration programs of the potential productivity of the severely retarded have used "artificial" modifications of work environments which were considerably different from the modus operandi of sheltered work programs, and the staff time required of such programs was very high. Often, the techniques required sophistication not commonly found in workshop supervisors. One approach to overcome these difficulties is to develop training strategies which would allow the severely retarded client to rely on internal modes of motivation, rather than external modes (i.e., token economies). (Martin & Flexer, 1975)

## Advocacy and Legal Rights

In the forward to a recent book entitled, Advocacy Systems for the Developmentally Disabled (1976), Bensberg and Rude give the following description of the rise of this area of technologies.

> The Developmental Disabilities Services and Facilities Construction Act (PL 91-517) was passed in 1971. This act focused upon those handicapping conditions which occur during the developmental period of life and which require services similar to those necessary for the mentally retarded. The Act was unique in that it sought to coordinate the multiple services required by the developmentally disabled as well as to provide for adequate planning for the service delivery system. In order to help assure widespread input in the planning effort, the Act mandated consumers, or spokesmen for consumers, be represented on the state councils.
>
> During the interim period of four years prior to the passage of the Developmentally Disabled Assistance and Bill of Rights Act (PL 94-103), in 1975, the consumer movement grew tremendously. As a result of litigation, the human and civil rights of the handicapped became more clearly established. Federal, state and private organizations began to establish standards relative to the facilities, programs and manner in which these services were to be provided. As a result of increasing scrutiny, it became apparent that some type of protective system was required to monitor the quality of services to the handicapped and to assure that the life-long needs of the developmentally disabled were provided at the time they are required. The Developmentally Disabled Assistance and Bill of Rights Act requires that each state shall institute a system to protect and advocate the rights of persons with developmental disabilities and that this system will have the authority to pursue legal, administrative and other appropriate remedies to insure the protection of the rights of such persons with developmental disabilities.
>
> Advocacy is certainly not new with this bill. Broadly defined, it includes any activity which involves a person acting on his own behalf or on the behalf of others to secure responses to perceived needs. Early advocates might have been family members or the extended family of nomadic tribes. Although the concept of advocacy is simple, it becomes complex when one considers the wide range of functions which might be designated to advocacy programs: advocates can act as friends, parents, legal guardians of persons or estates, and case managers. These responsibilities have been designated to parents, relatives, public officials and agency personnel prior to the passage of this Act and will continue to be provided by a variety of people and agencies.

The field of advocacy and legal rights is as complex with regard to the mentally retarded as it is for the non-retarded. Marie L. Moore (1976) has described an outline of the types of advocacy systems in use or development today. Alternate ways of classifying systems exist, but Moore's outline covers the major points of the others.

I. Case Advocacy
    A. Citizen Advocacy
    B. Ombudsman - private
    C. Ombudsman - public
    D. Legal Advocate
    E. Case Manager/Advocate
II. Class Advocacy
    A. System Reforms and Development (Legislative Advocacy)
    B. Community Organizational Advocacy
    C. Program Brokerage
    D. Protective Service System
    E. Consumer Action Groups. (Moore, 1976)

Citizen advocacy refers generally to a one-to-one relationship between a volunteer, and a retarded person. The volunteer, who usually comes from a private association or agency provides support in the form of defending the rights of the retarded person, and providing emotional support to him (her). The ombudsman, whether private or public is one who acts as an advocate and intercedes in receiving and investigating grievances, or initiating them on behalf of the retarded citizen. Ombudsmen may come from private advocacy councils or organizations, or from state Human Rights Commissions, or may be on the staff of an institution.

The legal advocate is a person or organization who represents the retarded person in litigation, or legal negotiations concerned with grievances, appeals or violations of rights.

The case manager or case advocate is a person who assists the retarded person seek information and services and helps overcome barriers to timely service delivery.

The common element in all of the above advocacy systems is that they are represented in a case by case fashion, on an individual basis.

Class advocacy systems are those which utilize the legislative process to effect changes in collective services for the retarded. Legislative advocacy uses the legislative process to secure rights of the retarded in such areas as labor, transportation, housing, health care and education through consumer representative organizations at state and federal levels.

Program Brokerage facilitates service development and expansion by eliminating barriers to service delivery and combining resources to maximize service benefits.

The Protective Service System is mandated service providing guardianship, trusteeship and other advocacy services. Consumer Action groups are groups of parents or adults who are disabled who act as pressure or special interest groups to advocate desired change.

## VIII. Service Delivery

Baroff (1974) illustrates the array of services for the mentally retarded in the following table:

Table 2-7

| Services | Service Agents | Service Disciplines |
|---|---|---|
| | PRENATAL | |
| Prevention<br>Prenatal care, treatment of the fetus, genetic counseling, therapeutic abortion. | Health agents<br>Primary physician, local health department, hospital clinic, fetology service. | Physician, public health nurse, genetic counselor. |
| | INFANCY AND PRESCHOOL | |
| Prevention (medical)<br>Metabolic screening, immunization, avoid lead paint ingestion, routine medical care, nutrition. | Health agents<br>Primary physician, well-baby clinic, (local health dept.), hospital. | Physician, public health nurse, nutritionist |
| Prevention (psychological)<br>Stimulation, training, education | Child care agents<br>The home, adoptive home (adoptive agency), foster care (social service), child development center. | Mother or mother surrogate, teacher and teacher-aide, social worker, volunteer (student, parent, foster "grandparent") |
| Identification<br>Screening, diagnosis, parent counseling, medical treatment, management. | Health agents<br>Well-baby clinic (health dept., hospital), primary physician, medical specialist, developmental evaluation clinic, home nursing service, local assoc., for retarded children, mental health service, pastoral counseling, genetic counseling | Public health nurse, pediatrician, psychologist, social worker, physical therapist, speech therapist, dentist. |
| Training and education<br>Self-help (feeding, dressing, toileting); language, cognitive, motor, social-emotional training. | Early childhood education agents. Child development center (generic and specialized). | Teacher, teacher-aide, psychologist, speech therapist. |

| Services | Service Agents | Service Disciplines |
|---|---|---|
| | INFANCY AND PRESCHOOL | |
| Residential | The home, adoptive home, foster family care, institution | Parent and parent surrogate, social worker, institutional staff providing special medical and related services. |
| | SCHOOL AGE | |
| Training & education<br>Self-help (as needed) academic, social, motor, language, recreational, vocational (prevocational, vocational, on-the-job) training; activities of daily living. | Education & rehabilitation<br>Child development center, public school (elementary, junior high, senior high) vocational rehabilitation agency, employer. | Teacher, teacher-aide, school psychologist, guidance counselor, speech therapist, rehabilitation counselor, business and industry. |
| Residential | Child care agents<br>The home, foster care (family group), group home, short term and long term institutional care | Parent and parent surrogate, social worker, staff of institution (physician, nurse, physical therapist, teacher, psychologist, speech therapist, rehabilitation counselor) |
| Recreational | Community recreational programs. Generic and special recreational resources; day programs; camping - day and overnight, summer, year-round, scouting. | Recreator, group worker, volunteer (student, etc.) |
| | ADULTHOOD | |
| Vocational<br>Prevocational, vocational (as appropriate) and on-the-job training; competitive employment; sheltered employment (extended employment and work activity). | Semiskilled and unskilled jobs in industry, service, and government; sheltered workshop; vocational rehabilitation agency | Employer, personnel manager, rehabilitation counselor, staff of sheltered workshop (administrator, evaluator, work supervisor, personal adjustment counselor, instructor). |

| Services | Service Agents | Service Disciplines |
|---|---|---|
| | ADULTHOOD | |
| Activity Program (Primarily for severely and profoundly retarded persons) | Adolescent and adult Activity center - preferably tied to a sheltered workshop. | Teacher, teacher-aide |
| Recreational | (see School age) | |
| Residential | Community and institutional. Home, group home, apartment, long term and short term institutional care. | Parent and surrogate parent, counselor, institutional staff (see "School age-Residential") |
| Advocacy Assuring the rights of retarded persons especially those who will not achieve independence. | Federal, State, and local services as provided by law, e.g., Social Security benefits, Veteran's benefits (children of servicemen), guardianship, legal counsel. | "Advocates" |

(p. 124, 125).

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# CHAPTER 3
# DISABILITY ANALYSIS: SCHIZOPHRENIA

## I. Definition

The term, schizophrenia, introduced by Bleuler in 1911, has largely, though not completely, superceded, the older term used by the German psychiatrist, Kraeplin, dementia praecox. The latter term reflected Kraeplin's belief that dementia, starting early and running a slow progressive course, had a deteriorating effect culminating in an impairment of mental powers. As the disorder does not always start early, and as the presence of true dementia (impairment of mental functioning) has been widely challenged, Kraeplin's term is now thought inappropriate. Though Bleuler's term means a splitting of the personality, schizophrenia should not be confused with such personality "splits" that occur in hysterical disassociation or multiple selves. Bleuler's term represents a general loosening of associative connections and of the organization of thought and behavior. This fragmentation of integrated behavior was considered by Bleuler to be the truly central disorder in schizophrenia (White, 1964).

In contrast with Kraeplin, Bleuler rejected the idea that deterioration is an inevitable aspect of schizophrenia. Kraeplin also stressed such symptoms as hallucinations, delusions, disorders of attention, stereotypes of motion, judgement disorders and considered them as effects of underlying somatic differences. On the other hand, Bleuler viewed many of the symptoms as secondary elaborations of a primary disturbance in affect and association. These disturbances are characterized by emotional blunting and expressions at inappropriate times and the fragemnted, illogical connection of ideas (Salzinger, 1973).

Kraeplin's contribution lies in his recognition that the states previously referred to as dementia precoce, katatonia, and hebephrenia shared important features in common. However, an erroneous implication of this synthesis is the notion that dementia praecox is a single unitary disease, much the same as any other disease is a single disease. Bleuler (1950), attempting to undo this notion, emphasized the possible diversity of these states. Because the different subvarieties exhibit a tremendous diversity of symptoms, other researchers have also challenged Kraeplin's classification of the divergent types under a single heading. The majority of workers, however, agree with Kraeplin that the different varieties of schizophrenia have enough in common to warrant giving them a common name. Most of the cases have obvious psychodynamic features. On the other hand, certain of the phenomenon are so bizarre and extravagant that it often seems impossible to explain them without resorting to chemogenic and histogenic hypotheses (White, 1974). In short, not all schizophrenics are alike. Patients differ in apparent etiology, prognosis, response to treatment, chronicity, and severity of manifested symptoms (Center for Studies of Schizophrenia, 1972).

Schizophrenia, then, is a word used to describe a complex mental disorder. In contrast to many illnesses, it is not localized in one part of the body. Rather, it affects all aspects of the personality. No generalizations hold true for all schizophrenics. In fact, it is possible for two people to be labeled "schizophrenic" and to show entirely different symptoms (Center for Studies of Schizophrenia, 1972).

Psychiatric nomenclature in general, and description and diagnosis of the schizophrenias in particular, is often too abstract to convey useful definitional information. Almost every model for explaining the various, seemingly inexplicable aspects of the schizophrenias has been investigated in an attempt to explain the phenomena. Nonetheless, the information has turned out to be more useful to the sciences than in explaining the disorder itself. One researcher (Salzinger, 1973) states that there is doubt whether an abnormality called schizophrenia actually exists. There is still contention as to the single or multiple nature of the disorder, its etiology, whether it changes over time, age of onset, etc. Psychiatrists differ about whom to designate as schizophrenic. The term has become sufficiently intellectually obscure and diffuse that sharp categorization of clinical manifestations has, to some extent, been lost and communication among experts has concordantly suffered. The greatest agreement about schizophrenia appears to lie in the ignorance of the disorder (Salzinger, 1973; Goldman, 1969).

At this point, given the nature of the confusion, one might ask then what is the basis of diagnosis of schizophrenia? Or is there one? Bleuler (1950) and others describe the common characteristic manifested in all the schizophrenias as a basic thought disorder which includes disturbances in perceptive, cognitive, associative, and memory functioning (Goldman, 1969). Bleuler points out that in every case, the various psychic functions are split off from one another. The personality loses its unity, and the integration of various psychic complexes does not occur. As Bleuler states, "the psychic complexes do not combine in a conglomeration of strivings with a unified result as they do in a healthy person; rather, one set of complexes dominates the personality for a time, while other groups of ideas or drives are 'split off' and seem either partly or completely impotent" (Bleuler, 1950).

The large category of the schizophrenias includes a group of disorders manifested by characteristic disturbances of thinking, mood, and behavior. Cognitive disturbances are marked by alterations of concept formation, often leading to misinterpretations of reality, hallucinations, and delusions. The latter two often serve a defensive, protective function. Disturbances of mood include ambivalence, constriction, and inappropriate emotional responses. There might also be a general loss of empathy with others. Behavior may be agressive, bizarre, or withdrawn (Salzinger, 1973). Disturbances of relationships with people, withdrawal from social participation, and retreat into oneself are all characteristics of schizophrenia. Though withdrawal in itself is not a disorder, it is the progressive personality disorganization--the breakdown of integrated thinking and adaptive behavior--that accompanies schizophrenic withdrawal that causes such behavior to become pathological. Such personality disorganization is at the root of schizophrenia (Jenkins, 1952).

Symptamology of the basic thought disorder has been described by Bleuler (1950) as representing alterations of the simple and compound mental functions. The first of the fundamental symptoms of altered simple mental functioning is a defect in association. This involves interference with the logical connection between ideas and their progression toward reality-oriented, goal-directed thinking. Ideas may interrupt other ideas, or there may be "thought deprivation" in which thoughts seem to be taken away entirely (Bleuler, 1950, p. 36). Disturbances of association may also be marked by "Klang-associations" where ideas follow one another because of similarities in sound, or there may be "echolalia" in which a patient will echo the statements of an interviewer. In advanced cases, speech may become so fragmented and bizarre that it degenerates into what has been termed a "word salad." Severe thought blocking, characterized by the patient's not being able to give vent to one of several competing thoughts, may lead to condensations--the arbitrary combination of certain words into one word. Perserveration, in which the same idea is repeated over and over again may be present, as well as stereotpyed thinking in which patients are preoccupied with the same topic to the exclusion of all others (Rosenbaum, 1970).

Defects in association are also characterized by the peculiar use of words and the invention of entirely new words, called neologisms. For many years, investigators thought that schizophrenic speech was so bizarre and irrational as to be unintelligible. Bleuler, applying many of the concepts learned from Freud and Jung, was able to frequently make sense of such speech (Rosenbaum, 1970).

Affective disorders are characterized by disharmonies and inconsistencies in the emotional life of an individual. Feelings are frequently inappropriate with peculiar giggling, smiling, frowning, and grimacing. Affective or emotional "blunting" (Bleuler, 1950) may be reflected in the schizophrenic's sometimes mundane, leaden speech. Patients may speak dispassionately or even cheerfully about the death of a loved one. Other times, they may appear confused, dazed, or delirious. Upon close observation, it might be noted that an apparently bizarre emotional outburst was in response to thoughts, hallucinations, or delusions. Such reactions often serve as defenses against these phenomena which are often accusatory or hostile (Rosenbaum, 1970).

Though Bleuler considered flattening or blunting of affect an important feature in the diagnosis of schizophrenia, it would appear that the condition is as much an artifact of prolonged hospitalization or institutionalization as it is intrinsic to the symptomatology of the schizophrenias. Since contemporary treatment tends to be more rapid, most patients demonstrate considerable affect, but it is often inappropriate to the surroundings and context (Rosenbaum, 1970).

Ambivalence, another defect of simple mental functioning, refers to the profound difficulty the schizophrenia has in coping with the simultaneous presence of opposite thoughts and feelings. Making a commitment in one direction or another becomes an extremely difficult task for the schizophrenic. Bleuler has divided ambivalence into three overlapping categories: affective ambivalence, the simultaneous presence of conflicting feelings; ambivalence of will, or "Ambi-Tendenz;" and intellectual ambivalence, the presence of conflicting thoughts (Rosenbaum, 1970).

In the area of simple mental functions, the schizophrenic should be distinguished from those patients with organic brain conditions. In the schizophrenias, sensation, memory, consciousness, and mobility are not always, or even often, disturbed. The schizophrenic patient may register both true and false orientation, revealing an awareness of both. Bleuler (1950) has termed this phenomenon "double registration" or "double orientation" (p. 378). Even where a schizophrenic patient's memory and consciousness are intruded on by an emotional complex, he will usually know what the interviewer is saying, in contrast to the patient with an organic brain syndrome (Rosenbaum, 1970).

The altered compound mental functions include autism, attention, the will, the person, schizophrenic "dementia," activity and behavior. Autism refers to the excessive focusing of attention on internal mental functioning. In other words, the schizophrenic will be preoccupied with fantasies, daydreams, hallucinations, delusions, etc. In contrast to the normal person, the schizophrenic cannot voluntarily withdraw himself from fantasy states. Partially as a result of this inability to direct his attention to reality, the schizophrenic may display a lack of awareness and attention paid to the external environment. Concomitantly, there will be a withdrawal of interest in interpersonal relations. Some patients manifest autistic "love affairs," asserting that a person prominent in the news or entertainment is in love with them. These imaginary relationships proceed from the patient's own fantasies (Rosenbaum, 1970).

Defects in attention are characterized by the patient's reduced capacity to maintain attention on a particular activity for very long. Though he may appear unaware of events around him, these are often registered and will be remembered months or even years later (Rosenbaum, 1970).

A defect in the will is manifested by the schizophrenic's inability or unwillingness to initiate behavior in such matters as dress or eating with some semblance of manners. In this state, the schizophrenic often responds to internal or external thoughts and impulses, acting on them without reflection. In other cases, the patient may be in a catatonic stupor and will be unable to will even the simplest act (Rosenbaum, 1970).

Defect in the person refers to misperceptions that patients may have about themselves and their identities. These are the result of delusional or hallucinated thinking (Rosenbaum, 1970).

Schizophrenic dementia or "pseudodementia" should not be confused with true dementia. While the schizophrenic manifests an apparent loss of the faculties of rational thought, true dementia, caused by organic changes in brain tissue, may remain stable at a certain level, or more commonly, go on to progressive deterioration. There are many cases of apparently "demented" schizophrenics, who after a period of years, spontaneously recover their capacity for rational thought, indicating, that little, if any, of the ability for rationalization has been lost. Likewise, many patients will show intact and normal mental functioning outside the domain of their delusional and autistic thinking (Rosenbaum, 1970).

Disturbances in activity and behavior have been described by Bleuler (1950) in the following manner:

> Outspoken schizophrenic behavior is marked by a lack of interest, lack of initiative, lack of a definite goal, by inadequate adaptation to the environment; i.e., by disregard of any factors of reality, by confusion, and by sudden fancies and peculiarities (Bleuler, 1950, p. 90).

Below is listed a brief summary and definition for each of the common accessory symptoms associated with schizophrenia. These occur simultaneously with the altered simple and compound mental functions.

Hallucinations

Hallucinations are defined as false perceptions without apparent sensory basis. In schizophrenia, they are generally of an auditory nature, with visual, olfactory, or tactile hallucinations being relatively rare. Hallucinations are often threatening or hostile, though other times they may be pleasurable (Rosenbaum, 1970).

## Delusions

Delusions represent a belief system for which there seems to be little or no evidence. These belief systems may vary from being well articulated and internally consistent (as in the paranoid schizophrenic) to being poorly articulated, inconsistent, and changeable (as in the many simple and mixed schizophrenias). In order of their frequency, delusions are most often concerned with persecution, self-reference, religion, sin, the sexual delusions of fidelity, jealously, erotomania; and those involving magic, the body, and myth (Bellak, 1958). The particular content of delusions is thought to reflect the individual's particular wishes and fears (Rosenbaum, 1970).

## Catatonic Phenomena

Catatonic phenomena involve alterations in the functioning of the voluntary muscles. There may be alterations of posture, gait, handwriting, speech, and response to environmental stimuli (Rosenbaum, 1970). This motor disorder may take the form of complete immobility, or catatonic rigidity, which appears to have become a clinical rarity; or may be characterized by the use of complicated mannerisms and rituals and speech changes which do not in and of themselves reflect a behavioral disturbance (Goldman, 1969). Also present are frequent negativism and stereotyping of behavior (Rosenbaum, 1970).

## Disturbances of Memory

Disturbances of memory occur when a complex delusion or hallucination intrudes into consciousness. When this happens, the patient, upon recovery, may frequently have amnesia for that period of his illness (Rosenbaum, 1970).

Despite the basic symptamology described by Bleuler, diagnosis is still extremely difficult in many cases. For example, in mild or atypical schizophrenia, many of the defects described by Bleuler may be impossible to detect. Several atypical forms of schizophrenia exist in which some but not all of the simple and compound functions are altered, or the alterations may be minimal and fluctuating. There may be errors in observation and interpretation of the symptoms, or an interviewer, while trying to obtain information on which to base a diagnosis, may influence the behavior he is trying to evaluate. For these and other reasons, a diagnosis of schizophrenia often has low reliability and validity (Salzinger, 1973).

The age of risk for the schizophrenias of adolescence and adulthood is thought to be from puberty to 45 years. Patients who develop psychiatric conditions before or after these limits are not considered to be typically schizophrenic (Rosenbaum, 1970).

## The Taxonomy of Schizophrenia

Many types of schizophrenia have been described over the past 50 years. Some of these proposed types have fallen into disuse, while others still carry considerable clinical validity. Kraeplin and Bleuler described classical or typical cases of schizophrenia as well as atypical forms. Within each of these major headings, there are several subtypes which are listed below:

Typical Schizophrenias

- Classical Subtypes:
  - Simple
  - Hebephrenic
  - Catatonic
  - Paranoid
  - Mixed
  - Undifferentiated

Atypical Schizophrenias

- Schizo-Affective Psychosis
- Acute Homosexual Panic
- Acute Paranoia
- Ambulatory Schizophrenia
- Postpartum or Puerperal Schizophrenia
- Periodic Catatonia

Subsequent authors have added to this list, or in some cases, expanded the boundaries and changed the nomenclature of the categories. The basic distinctions, however, remain the same (Rosenbaum, 1970).

Salzinger (1973) lists the following categorical breakdown which is used by the American Psychiatric Association's Diagnostic and Statistical Manual of Mental Disorders (1968) to describe schizophrenia:

1. Simple type
2. Hebephrenic type
3. Catatonic type
    *a. Excited
    *b. Withdrawn
4. Paranoid type
5. Acute schizophrenic episode
6. Latent type
7. Residual type
8. Schizo-affective type
    *a. Excited
    *b. Depressed

* 9. Childhood type

*10. Chronic, undifferentiated type

*Categories not in the International Classification of Diseases, 8th Revision, but used exclusively in the United States.

The American Psychiatric Association category of schizophrenia is based largely on symptoms.

Rosenbaum (1970) also discusses other types of classification systems:

1. True schizophrenia vs. schizophreniform psychoses: This classification appears to be based on whether the patient recovers or not. True schizophrenia applies to patients whose illness is progressive, severe, and deteriorating; such patients rarely, if ever, show a significant recovery. Schizophreniform applies to all psychoses that result from clear precipating stress (usually psychological, but also occasionally organic), that demonstrate illusions, ideas of reference, confusion, and disorientation, and for whom the prognosis is relatively good (Langfeldt, 1951).

2. Process vs. reactive schizophrenia: This classification system is based on the development of the disorder. Process schizophrenia refers to the disorder suffered by patients who insidiously and without apparent stress slide into a schizophrenic state, i.e., they seem to be the victim of an inherent schizophrenic process. Reactive refers to patients who become schizophrenic only after severe and obvious external stress; their psychosis is a reaction to such stress.

3. Acute vs. chronic schizophrenia: This classification is based both on the onset and course of the schizophrenia. Three parameters are used to differentiate between chronic and acute:

    a. Length of onset (the time from the beginning of personality change to the appearance of the overt psychosis). If this time is less than six months (some authors use three months) the patient's condition is said to be *acute*; if it is greater, it is said to be *chronic*.

b. Reversibility--The official nomenclature of the American Psychiatric Association has used *acute* to be synonymous with reversible, and *chronic* to be synonymous with irreversible. By this criterion, a schizophrenic patient who went into remission after 20 years could be considered acute. This classification is similar to "true schizophrenia" vs. schizophreniform as described above.

c. Clinical course--If a patient has been continuously schizophrenic for two years or more, he merits the label of *chronic*; if his illness clears before two years, he is described as having been *acute*.

A definite problem with the above classification is that authors rarely specify which meaning of acute and/or chronic they are using (Rosenbaum, 1970).

## Descriptions of the Types of Schizophrenia

*The Typical Schizophrenias* : Patients in this category clearly show all the altered simple and compound mental functions described by Bleuler. Additionally, they may manifest some of the accessory symptoms. When using the process-reactive distinction, the typical schizophrenias will manifest Bleuler's basic symptoms plus the characteristics of "reactive" schizophrenia. The presence of these two criterion would lead in Europe to a diagnosis of "schizophreniform psychosis" (Rosenbaum, 1970). The following is a discussion of the classical subtypes of the typical schizophrenias.

### Simple Schizophrenia (schizophrenia simplex; dementia simplex)

The characteristic symptoms of simple schizophrenia are a gradual loss of interest, apathy, and indifference leading to an inconspicous impoverishment of social, intellectual, and emotional relationships accompanied by social withdrawal, and the lack of ambition for personal advancement in the world. Age of onset is frequently early adolescence, and symptoms generally come on gradually over a period of months or years. The patient may become idle, quiet, and appear contented. These are all symptoms of withdrawal into an autistic world. The affective life becomes outwardly shallow and uneventful. Perhaps the most salient characteristic of simple schizophrenia is the lack of assertiveness. Sometimes this lack is so marked that it prevents the individual from making a good sexual adjustment, from expressing anger, from standing up for his rights, and from interacting with his peers altogether (White, 1964). Often it is obvious that patients of this type do desire to make contact with others, but they find even this small amount of assertiveness difficult (Kant, 1948).

Thinking and attention do not appear to be particularly disturbed, and the patient is not in any general sense out of contact with reality. There is usually only minimal memory impairment, and any loss of mental capacity seems secondary to the general withdrawal of interest (White, 1964).

In the absence of more severe symptoms, many simple schizophrenics are ignored and quietly tolerated by the community. Others may not even be able to sustain a marginal existence and will require hospitalization. Patients of this type rarely show substantial improvement (Rosenbaum, 1970). Simple [illegible] schizophrenia , in general, is much less dramatically psychotic than are the hebephrenic, catatonic, and paranoid types of schizophrenia. It is further differentiated from the schizoid personality, in which there is little or no progression (American Psychiatric Association, 1968). Many authors feel that simple schizophrenia may be more biologically and hereditarily determined than the other major subtypes (Rosenbaum, 1970).

## Paranoid Schizophrenia

The primary characteristic of paranoid schizophrenia is the presence of persecutory or grandiose delusions, (these are...typically changeable, numerous, fantastic, and accompanied by hallucinations. The particular form of the thought disorder lies in the patient's misinterpretations of reality and of other's motives (Rosenbaum, 1970). In the early stages of the illness, it is generally possible to discern a connection between the patient's misinterpretations of reality and his personal wishes, needs, and fears. In the later stages, however, the delusions tend to spread and become disorganized (White, 1964). Paranoid schizophrenia should not be confused with pure paranoia. In the latter condition, there is thinking that resembles, or is akin to, normal thinking. In paranoid schizophrenia, however, there is relative preservation of the intellectual functions. The patient displays an extreme loss of interest, loss of contact with reality, and a general disintegration of personality. The clearest distinguishing feature between paranoia and paranoid schizophrenia is the absence or presence of hallucinations (White, 1964).

Though the term, "paranoid," is often thought to represent a synonym for unpleasant delusions of suspiciousness and hostility, it is just as properly applied to the pleasant delusional states of excessive religiosity that are sometimes seen in paranoid schizophrenics (Rosenbaum, 1970).

The frequent delusions and hallucinations that accompany the condition are more often of a persecutory or grandiose nature. The patient's attitude and behavior, frequently consistent with his delusions, are often hostile and agressive. Generally the disorder does not manifest the gross personality disorganization of the hebephrenic and catatonic types. Outside the areas of delusional thinking, intellectual functioning tends to be well preserved (Rosenbaum, 1970).

Projection, the attribution of the patient's own repressed thoughts and feelings onto outside forces such as other people or hallucinated voices, is used extensively by the paranoid schizophrenic. The phenomenon serves a defensive function in that, by using it, the individual avoids anxiety by attributing certain of his tendencies, not to himself, but to other people.

Wishes and fears are transformed into external facts for which the individual is not responsible (White, 1964).

Age of onset of paranoid schizophrenia is frequently later than onset of the other subtypes of schizophrenia, with new cases appearing in patients who are in their thirties or forties. Prognosis is based on the degree of the patient's acceptance of a paranoid explanation for his condition. The patient who accepts a psychotic explanation for his mental status has a poor prognosis; the patient that remains anxious and uncertain as to the reality of his paranoid experiences has a better prognosis (Rosenbaum, 1970).

Paranoid schizophrenics generally maintain an attitude of aloofness and contempt for the world, but often they are frightened by their delusions and hallucinations. Overt acts of physical aggression may occur if the patient decides that a person external to his real situation is personally responsible for his condition. This selective aggressiveness is in contrast to that of catatonic excitement, which characteristically is undifferentiated and random. Serious suicide attempts may also occur (Rosenbaum, 1970). Paranoid schizophrenia is sometimes differentiated into three subtypes: hostile, grandiose, and hallucinatory (Salzinger, 1973).

## Catatonic Schizophrenia

Catatonic schizophrenia is divided into two subtypes: the stuporous or withdrawn and the excited. The outstanding feature of both types is a disturbance of mobility characterized by alterations in the normal use of the voluntary muscles. The catatonic patient may display peculiar postures and gestures, curious grimaces, and stereotyped actions which are repeated over and over again (White, 1964).

In the stuporous state, the patient appears to be out of contact with reality (Rosenbaum, 1970). The state is distinguished by generalized inhibition manifested in the forms of stupor, mutism, negativism, or waxy flexibility (American Psychiatric Association, 1968). The patient may adopt strange, unconfortable-looking, statue-like postures which may be maintained for minutes or hours at a time. In spite of their appearance, EEG and metabolic studies have shown that these patients are actually in a state of high physiological arrousal (Rosenbaum, 1970). The catatonic might be said to be in a state of active immobility. Sometimes the patient will manifest strong muscular resistance if anyone attempts to change his position (White, 1964). Other patients, displaying waxy flexibility, may allow their limbs to be passively moulded by an examiner into new postures. Patients demonstrating waxy flexibility may also show command automatism, responding in a robotlike manner to an interviewer's suggestions (Rosenbaum, 1970).

Despite these indications, the catatonic is neither in a state of mental stupor. Indeed, many recovered catatonics demonstrate that their awareness of activities around them had not suffered in the least. Though the catatonic refuses or cannot react, his mind remains alert. Thought and fantasy continue throughout the stuporous state. Sometimes the stupor ends in response to an apparently hallucinated command, presumably signaling the end of silent, inner encounter (White, 1964).

The catatonic may portray a dreamlike facial expression, or there may be grimacing or facial tics. Over time, some patients may become so immobilized that they deteriorate into a vegetative state. They may neither eat nor maintain sphincter control, and tube feedings may be necessary to avoid death due to inanition (Rosenbaum, 1970).

A stuporous patient, usually without warning, may suddenly become very active. The patient is then termed catatonically excited. The excited states, though usually of much shorter duration than the stuporous, are often extremely violent with real danger of both homicide and suicide. Sometimes the state is accompanied by delusions, hallucinations, and feelings of great power; other times it appears more like a disorganized outbreak of energy (White, 1964). In extreme cases, those that manifest uncontrolled, destructive excitement, patients may run the risk of death by exhaustion. Sometimes repeated electroshock treatments in a single day are necessary to arrest the excitement. Periods of excitement may revert to stupor as quickly as they appeared, or there may be intervening periods of calm and recovery (Rosenbaum, 1970).

Some reserachers feel that catatonic stupor may be the first frankly schizophrenic manifestation presented in an acute schizophrenic episode. Recovered catatonic patients often relate feelings of great destructive power, implying that the stupor was a defense against their fantasized power (Rosenbaum, 1970).

### Hebephrenic Type

This is the least clearly defined of the schizophrenias, often used to describe patients more severely disordered than the simple schizophrenic but without the predominant delusional formations or disturbances of mobility. The hebephrenic psychosis is characterized by disorganized thinking, shallow and inappropriate affect (smiling and giggling, for example), silly and regressive behavior and mannerisms, and frequent hypochondriacal complaints (American Psychiatric Association, 1968). The patient may also talk in an incoherent manner, frequently using neologisms. His speech may jump from image to image, only occasionally returning to a theme. Speech may ultimately degenerate into a "word salad" in which words are strung together in incongruous chains without conveying any precise idea (White, 1964). Delusions and hallucinations may be present, but are usually transient and scattered with little continuity or organization (American Psychiatric Association, 1968).

Age of onset is frequently between the ages of 15 and 21. Symptoms usually come on slowly, but once developed, deterioration takes a fairly rapid course (White, 1964; Rosenbaum, 1970).

The course of the disorder tends to be chronic with good recovery a rarity in patients who have been ill for more than a couple of years. Hebephrenics are often initially diagnosed as other subtypes. Simple and hebephrenic patients who have been ill for several years are often difficult to distinguish, and the diagnostician must turn to the patient's history in order to classify the illness: the hebephrenic shows overt signs of his illness during the early years of his illness; the simple schizophrenic does not (Rosenbaum, 1970).

## Mixed Schizophrenia

The four major subtypes of schizophrenia, with the exception of simple schizophrenia, may be present in any patient to varying degrees. In fact, schizophrenics rarely present pure cases of one of the subtypes; thus, the different types described above must be considered as diagnostic abstractions. A patient who manifests an admixture of more than one subtype is diagnosed as showing mixed schizophrenia with the predominant subtype specified. In other words, a patient may be described as a "mixed schizophrenic with catatonic features." Furthermore, since schizophrenia is not a static condition, the salient symptomatology may change over time. For example, a patient who is initially catatonic might begin to manifest hebephrenic symptoms (Rosenbaum, 1970).

## Undifferentiated Schizophrenia

Undifferentiated schizophrenia refers to those patients who show mixed schizophrenic symptoms and who present definite schizophrenic disturbances or thought, affect and behavior, but do not show the characteristics of one of the major subtypes. APA (1968) terminology for this category is "Schizophrenia, chronic undifferentiated type" (American Psychiatric Association, 1968).

## Atypical Schizophrenias

Atypical schizophrenia refers to those patients who show some, but not all, of the altered simple and compound mental functions described by Bleuler, or those patients who manifest the symptoms intermittently or unconvincingly (Rosenbaum, 1970). As the American Psychiatric Association's classification scheme does not utilize the differentiation, "Typical" and "Atypical", differences in nomenclature and definitional boundaries of the various subtypes of this section will be discussed.

### Schizo-Affective Psychosis

The American Psychiatric Association (1968) uses the term "Schizophrenia, schizo-affective type" for this category. As the two terms represent essentially the same set of conditions in both classification systems, they can, presumably be used interchangeably. In this disorder, schizophrenic thought disturbances occur simultaneously with mania, depression, or both. Onset of the illness mormally occurs during adolescence and the initial diagnosis is usually manic-depressive psychosis. However, as attacks are repeated over the years, the thought disorder gradually becomes more predominant and the mood disturbances associated with mania and depression less so. Not all patients initially diagnosed as having manic-depressive psychosis will develop a schizophrenic picture, and most of them will not (Rosenbaum, 1970). The APA distinguishes two subtypes of schizo-affective psychosis: excited and depressed.

### Acute Homosexual Panic (Kempf's Disease)

This condition, characterized by agitation and panic, occasional assaultiveness, and preoccupation with homosexuality and fears of homosexual attack, may be precipitated by various circumstances. These include seductive closeness or an actual attempt at seduction by a member of the same sex, failure in heterosexual performance, or separation from home and friends. Apart from the considerable preoccupation with homosexual material, the disorder manifests the same clinical picture that is seen in many acute schizophrenic episodes. Consequently, some researchers consider it to be only a variant of such episodes, not warranting a separate diagnostic classification (Rosenbaum, 1970).

The American Psychiatric Assocation describes "acute schizophrenic episode" as a condition distinguished by the acute onset of schizophrenic symptoms, often associated with confusion, perplexity, ideas of reference, dreamlike dissociation, and excitement, depression, or fear. It is distinguished from simple schizophrenia by its acute onset. Over time patients may take on the characteristics of catatonic, hebephrenic or paranoid schizophrenia. In many cases, patients recover within weeks of onset, but sometimes the disorganization becomes progressive. More frequently, remission is followed by recurrence (American Psychiatric Association, 1968).

## Acute Paranoia

Acute paranoia is also known as acute polymorphic delirium, exhaustion psychosis, and combat psychosis. It is a temporary condition characterized by illusions which gradually develop into hallucinations and delusions. It is brought on by exhaustion or by other psychologically determined causes. After the episode is over, the personality is generally well-preserved and integrated (Bellack, 1958).

## Ambulatory Schizophrenia

One of the uses of the term, ambulatory schizophrenia, is to describe patients who are obviously schizophrenic but who have been able to maintain a semblance of normality and to function more or less appropriately in the community. Used in this sense, however, the term has little meaning outside of designating someone who is schizophrenic but not hospitalized (Rosenbaum, 1970).

A second use of the term is to describe several states that lie on the borderline between psychosis and neurosis. Currently there are three subtypes of ambulatory schizophrenia: pseudoneurotic schizophrenia, pseudopsychopathic schizophrenia, and borderline character. All three subtypes are referred to as "masked schizophrenia," implying that the classical schizophrenic symptomology is obscure but can be detected through close observation and the use os special diagnostic techniques (Rosenbaum, 1970).

The American Psychiatric Association has grouped these subtypes under the term, "Schizophrenia, latent type", utilizing the category for those patients having clear symptoms of schizophrenia but no history of a psychotic schizophrenic episode. (American Psychiatric Association, 1968).

1. Pseudoneurotic schizophrenia is characterized by pan-neurosis, pan-anxiety, poor interpersonal relationships, anhedonia, polymorphous perverse sexuality, and a tendency toward classical schizophrenic thought disorder. Pan-neurosis refers to patients who manifest numerous neurotic symptoms. A single patient may evidence "obsessional thoughts, compulsive acts, phobias, hysterical conversions, anxiety over body functioning, depression, inability to concentrate, and feelings of unreality and depersonalization" (Rosenbaum, 1970, p. 32).

Pan-anxiety refers to an individual's excessive concern about his psychological functioning. The patient will be unable to experience any area of psychological functioning in an anxiety-free manner. He may worry about his social contacts, his work performance, sexual life, and mental and physiological functioning. Consequently, his social relationships may tend to be decimated, superficial, and chaotic. Typical schizophrenic signs such as associative disturbances or autism may be immediately apparent or may emerge only under stress, through the use of diagnostic techniques, such as the Rorschach or free association, or under the effects of sodium amytal (Rosenbaum, 1970).

Anhedonia refers to the individual's reduced capacity or total inability to experience pleasure. The individual will find nothing in life that is particularly pleasurable. Polymorphous perverse sexuality applies to those persons whose sexual lives have no organization toward intercourse, or even toward a particular perversion. Instead, all kinds of sexual activity will occur indiscriminately (Rosenbaum, 1970).

Pseudoneurotic patients may have past histories of overt psychotic episodes, though usually these were of brief, with prominent somatic hallucinations and delusions. Occasionally, chronic schizophrenics may improve to the point of psuedoneurotic schizophrenia. Most individuals manifesting the condition have never had schizophrenic episodes. Such persons have been able to conform to community behavioral norms and have escaped any trouble with legal authorities or hospitalization by friends or relatives. A large percentage of patients seen in psychiatric clinics recive the diagnoses of ambulatory and pseudoneurotic schizophrenia. In some clinics, it is estimated that between one third and one half of all patients, especially males, are diagnosed as suffering from one of two conditions (Rosenbaum, 1970).

2. Pseudopsychopathic schizophrenia. A patient diagnosed as a pseudopsychopathic schizophrenic will be basically schizophrenic, but symptoms will be masked by antisocial behavior. As a result of this masking they are often initially diagnosed as psychopathic personalities. Closer observation, however, reveals many different neurotic symptoms and diffuse anxiety. Also, the patients are often found to lead a chaotic, polymorphous sexual life. Such

individuals are also referred to as pre-psychotic personalities. Antisocial behaviors that may be manifested by such patients include drug addiction, alcoholism, larceny, bigamy, and other aggressive and destructive acts such as assault and robbery. Sexually, these individuals are often overtly perverse (Rosenbaum, 1970). Though deterioration into classical schizophrenia does not usually occur, some pseudopathic patients may become overtly psychotic when confined. They should not be confused with schizophrenic patients who commit crimes or antisocial acts during an active psychotic episode (Weiner, 1958).

3. Borderline character is often difficult to distinguish from pseudoneurotic schizophrenia. The difference appears to lie in the magnitude of the disorders. The borderline character will have less neurotic complaints than the pseudoneurotic. Though their interpersonal functioning may be markedly limited, they generally have formed a few important relationships and are able, at least in some areas of life, to function in a relatively anxiety-free way. Patients may use words in a peculiar manner and manifest eccentricities in manner and dress, though they are usually unaware of this. The basic thought disorder, though present, is not as close to the surface as it is in pseudoneurotic schizophrenia (Rosenbaum, 1970).

## Postpartum Schizophrenia

Postpartum schizophrenia is diagnosed when schizophrenia appears in either parent in the period immediately prior to or following birth of a child. Authors differ in how much time may elapse between before or after birth and the appearance of the disorder in order for this diagnosis to be made. Melges (1968) proposes a time period from one month before birth to three months after birth. The etiology of this type of schizophrenia is subject to controversy. It has been speculated that physiological hormonal changes associated with childbirth might be responsible for the symptoms (Hamilton, 1962; Bower & Altschule, 1956). Since the condition occurs in males, the implications of this explanation are unclear. Other authors feel that the psychological stress of childbirth may precipitate the condition. Both explanations suffer from unclear evidence as to how much either hormonal or psychological factors are implicated in producing the disorder (Towne & Afterman, Rosenbaum, 1970).

### Periodic Catatonia

This form of atypical schizophrenia was first described by Gjessing (1966). The syndrome is characterized by weeks or months of normal functioning which alternate with episodes of catatonic stupor or excitement (Rosenbaum, 1970).

## The Related States

There exist a group of conditions which show little, if any, of the classical symptomatology of schizophrenia, but do possess points of similarity with the schizophrenias. These are termed related states and include schizoid characteri, pure paranoia, paranoid state, Ganser syndrome, and alcoholic hallucinosis (Rosenbaum, 1970).

### Schizoid Character

The schizoid patient is isolated, introverted, and unable to form close friendships. Such individuals generally keep to themselves and display aloof attitudes of superiority and contempt. Previously, most schizophrenics were thought to be premorbidly schizoid, and that the schizoid was likely to develop schizophrenia. These assumptions have since been refuted. It appears that no more than one third of all schizophrenics have a history of schizoid character, and only a very few schizoids become schizophrenic (Rosenbaum, 1970).

### Pure Paranoia and Paranoid State

This disorder, in contrast with paranoid schizophrenia, shows none of the fundamental symptoms of the thought disorder. Its main characteristic is a disturbance of logic. This usually consists of a single false assumption upon which the patient builds a complicated and internally consistent system of logic. This faulty logical system exists apart from the rest of the patient's mental functioning which is not impaired. This false belief system may persist for years (Rosenbaum, 1970; Cameron, 1959). Some authors doubt that pure paranoia actually exists. They believe that patients manifesting this condition are paranoid schizophrenics with only minimal thought disorder (Rosenbaum, 1970).

Paranoid state is a condition very similar to pure paranoia. The delusions, however, are not so intricate and extensive as exists in the latter state. The absence of fragmented or bizarre thoughts is also conspicuous, further differentiating the condition from paranoid schizophrenia (Rosenbaum, 1970).

## Ganser Syndrome

The Ganser or Stockade syndrome is characterized by paralogical thinking, talking past the point, and pseudostupidity. Sometimes there is a marked degree of amnesia. It is most often found in people facing military or civilian prosecution. The patient may show overt psychosis when imprisoned or given sodium amytal. Pseudostupidity refers to those patients who answer questions incorrectly, but in such a manner that indicates that the right answer is known (Rosenbaum, 1970).

## Alcoholic Hallucinosis

The term refers to patients who develop hallucination, usually of an auditory nature, during, or more commonly, after periods of heavy drinking. Since such hallucinations are often accusatory and threatening, the patient may respond violently. Hallucinosis may continue for days or weeks after cessation of drinking. If the hallucinations persist for an inordinately long period of time, there is the possibility that the patient is a latent paranoid schizophrenic, drinking being the sufficient condition for its appearance (Rosenbaum, 1970).

## Childhood Schizophrenia

This category of schizophrenia refers to cases in which schizophrenic symptoms appear before puberty, but generally after the first four or five years of life. Mahler (1952) has described the disorder as symbiotic psychosis; the child may fail to develop an identity separate from the mother's. Any threat of separation from the mother may throw the child into a disorganized panic, the central aspect of the numerous symptoms. The child may also manifest autistic, atypical and withdrawn behavior, gross immaturity and inadequacy in development (American Psychiatric Association, 1968; White, 1964). Such developmental defects may result in mental retardation. The relationship of childhood schizophrenia to the adult disorder is poorly understood (Center for Studies of Schizophrenia, 1972). Though similar in some aspects, childhood schizophrenia should not be confused with early infantile autism.

## II. Societal Characteristics of Schizophrenics

The literature shows prevalence, incidence, and costs associated with schizophrenia.

## Prevalence/Incidence

Basic to the evaluation of the prevalence and incidence of schizophrenia is the issue of defining the behavior pattern being investigated. For the most part, investigations having qualitative significance are based on the more severe cases of the illness requiring hospitalization. The hospitalized population, however, is generally recognized as representing only of duplications were taken into account, incidence rates approximated from mental health facilities would still overestimate the "incidence of treated illness" since there is no assurance that these admissions represent only persons experiencing the disease or disorder for the first time in the a fraction of the total number of cases in a given population. For example, in 1941, Tietze, Lemkau & Cooper identified 25 percent diagnosed cases residing in the community beyond those hospitalized at a particular time in 1936. In addition to these cases, one must assume the existence of a considerable number of neglected, undiagnosed, or unrecognized cases. A further problem is that cases of schizophrenia which are not marked by exaggerated, peculiar behavior, or by aggression are not usually counted (Lemkau & Crocetti, 1958).

Another problem basic to estimating the incidence and prevalence of schizophrenia is the nature of its definition. As has been discussed earlier, the definition of schizophrenia has undergone considerable revision since the syndrome was first recognized. Initially it was known as dementia praecox, implying that dementia was an inevitable aspect of the illness,and therefore, central to the diagnosis of schizophrenia. Bleuler changed this definition to one that focused on the primary and secondary symptoms. In the 1930's, the syndrome came to be known primarily as an affective disturbance with emphasis on the so-called schizo-affective states. The definition underwent further broadening and change in the 1940's and 1950's which were marked by the increasing identification of schizophrenia in children. Over time, the major result of these definitional changes has been to broaden the diagnostic criteria of schizophrenia, and consequently, more and more cases of schizophrenia have come to be recognized (Lemkau & Crocetti, 1958).

A true incidence rate for schizophrenia and total mental disorder is probably impossible due to the shifting values and preferences as to who is to be considered schizophrenic or mentally ill in a given community. Furthermore, researchers are divided as to which is a more accurate indication, the incidence or prevalence rate (Goldberg & Morrison, 1968).

The following information, which further describes some of the problems in estimating prevalence and incidence rates of schizophrenia, is largely taken from Taube & Rednick's (1973) special report on the utilization of mental health resources by persons diagnosed with schizophrenia (DHEW Pub. No. 73-9110).

Schizophrenia continues to be one of the predominant psychiatric disorders being treated in mental health facilities. In 1969, almost one quarter of the total patient care episodes in mental health facilities were for persons diagnosed with schizophrenia. To approximate the incidence and annual prevalence of treated schizophrenia, the following two basic indices are generally used: 1) the number of additions to mental health facilities, and 2) the number of patient care episodes in these facilities. However, data approximated from studies of mental health facilities do not properly represent true incidence or prevalence rates since those cases which do not come under care of mental health facilities have not been included.

In regard to incidence, two types of duplication can occur when studies are made from mental health facility data: 1) the same person may be admitted more than once to a particular facility during any given year; that is, the same person can be counted as many times as he is admitted, and 2) the same person may be admitted to two or more different facilities during the year, and each admission to each facility is counted. Even if these two types period under consideration (Taube & Rednick, 1973, p. 1). Prevalence rates that are based on patient care episodes (the number of residents in inpatient facilities at the beginning of the year, or the number of persons on the rolls in non-patient facilities, plus the total additions to these facilities during the year) reflect interval prevalence. Interval prevalence refers to the number of cases at the beginning of the interval of observation, plus the number of new ones added during the interval. This may be contrasted with point prevalence or the ratio of the number of cases of a disease in a defined population to the number of people in that population as of a given date.

In a true interval prevalence, there are two components: 1) an unduplicated count of cases at the beginning of the interval, and 2) an unduplicated count of new cases added during the interval. However, neither of these two components can be closely approximated since total additions which would be the nearest equivalent to the latter component involves, as indicated above, a duplicate counting of persons. Furthermore, the number of cases at the beginning of the interval as found by adding the number of residents in inpatient facilities and the number of persons on the rolls of outpatient facilities at the beginning of the year, may be inaccurate as it is possible for one individual to be on the rolls of an outpatient clinic and also be participating in a day care program or perhaps be on the rolls of two different outpatient clinics at the same time. Consequently, some duplicate counting of persons occurs in approximating the number of cases at the beginning of the interval (Taube & Rednick, 1973, p. 2).

Dunham (1965) discusses problems associated in using first admissions to mental hospitals as representing measures of incidence and prevalence of mental disorder in general or of a specific mental disorder such as schizophrenia:

1. Certain cases never go to treatment centers of hospitals but continue to reside in the community.

2. Population (geographic) mobility creates difficulty for the researcher who wishes to obtain an incidence rate in a particular community.

3. Marked difficulties exist in determining the exact point in time when a person with a psychiatric disorder should be considered a "case." That is, should an individual be counted at that point in time when the disorder is first in evidence or when for the first time he seeks or is forced into treatment?

Along with the rate of first admissions, another procedure which has been utilized to estimate incidence and prevalence of mental disorder in general and schizophrenia in particular, is the house-to-house survey. Here a given population group is taken out of the households within the population being sampled, or sometimes an attempt is made to provide total coverage. The focus is on the number of persons in the household, either hospitalized or non-hospitalized, that have a psychiatric illness on the day the survey is conducted. This procedure, however, only yields a prevalence rate. Many researchers argue that this is the only kind of count that has any meaning with respect to psychiatric disorder because of the difficulty in determining when a mental disorder began. Nevertheless, sometimes an attempt is made to calculate an incidence rate from such data. Such a rate invariably faces the same criticisms as a rate based entirely on first admissions (Dunham, 1965).

Other procedures which have been used to study incidence of psychiatric disorders are random sampling of persons drawn from a given community, and birth-register follow-up. Neither of these methods have been successful in determining the exact incidence or prevalence of a specific mental illness or the rate at which it could be expected to develop in any population. Difficulties in defining what constitutes a specific incidence have arisen; and too, investigators differ on what cases they should count. Some studies include all people who have developed or had a mental disease at any time during their life. Others count only those who are sick at a given time, as in the house-to-house survey. All of these types of studies are largely prevalence studies and provide little information with regard to incidence. This is a very important consideration in that it is the incidence rate that reflects how much illness of a particular kind can be expected in a given population. A further consideration is the length of psychiatric illnesses which affect the size of prevalence rates as well as the number of facilities necessary for treating and caring for persons with psychiatric disturbances. To date, most studies utilizing the methods described above, have been criticized for incomplete coverage when trying to obtain an incidence figure (Dunham, 1965).

When prevalence rates for total mental disorder, psychoses, and schizophrenia are compared, variations in the rates across studies are greatest for total mental disorder, somewhat less marked when only psychoses are considered, and quite similar when only schozophrenics are counted. This perhaps indicates that there is much greater agreement among investigators in defining schizophrenia than exists when attempts are made to estimate prevalence for total mental disorder. Table 3-1 shows the number and prevalence rates for total psychoses and schizophrenia reported in six North American studies. Most of these studies were conducted by searching the hospital and clinical records and reporting the number of mental cases present in the population of risk (Dunham, 1965).

When compared with all forms of psychosis, schizophrenia is the most common. One person out of five admitted for the first time to a mental hospital is given this diagnosis. If spontaneous recovery does not occur, or if treatment is not successful, the patient may become a public charge for forty or fifty years. Because the disorder has a chance to last so long, schizophrenics accumulate in mental hospitals and constitute something like 50% of the institutionalized population at any given time (White, 1964). Table 3-2 is a summary of several studied of the prevalence of schizophrenia in the United States.

## TABLE 3-1

## NUMBER AND PREVALENCE RATES* FOR TOTAL PSYCHOSES AND SCHIZOPHRENIA REPORTED IN SIX NORTH AMERICAN SURVEYS

| Source | | Population | Total Psychoses No. | Total Psychoses Rate | Schizophrenia No. | Schizophrenia Rate |
|---|---|---|---|---|---|---|
| Cohen & Fairbank | 1933 | 56,044 | 335 | 6.0 | 127 | 2.3 |
| Lemkau | 1936 | 57,002 | 367 | 6.5 | 158 | 2.9 |
| Roth & Luton | 1938-1940 | 24,804 | 160** | 6.4 | 47** | 1.9 |
| Hollingshead & Redlich | 1950 | 236,940 | 1,452 | 6.1 | 845 | 3.6 |
| Eaton & Weil | 1951 | 8,542 | 53** | 6.2 | 9** | 1.0 |
| Pasamanick | 1952 | 809*** | 17 | 4.3 | --- | --- |

*All rates per 1,000 total population

** Includes active and inactive cases

***Sample drawn from a random sample of households

Source: Dunham, 1965

## TABLE 3-2

## THE PREVALENCE OF SCHIZOPHRENIA*

| Source | | Rate |
|---|---|---|
| Cohen & Fairbank | 1933 | 2.3 |
| Lemkau | 1936 | 2.9 |
| Roth & Luton | 1938-40 | 1.9 |
| Hollingshead & Redlich | 1950 | 3.6 |
| Eaton & Weil | 1951 | 1.0 |
| Taube & Rednick | 1969 | 4.2 |
| Taube | 1971 | 4.4 |

*All rates per 1,000 population

In the United States, incidence rates of psychiatric disorder have been based largely upon first admissions to various kinds of mental hospitals, and in some instances, other types of psychiatric facilities. Several incidence studies have been conducted which are primarily based upon a census of hospital records. Other studies are based upon hospital first admissions. It should be noted that incidence rates, in general, seem much more stable and uniform than prevalence rates. Incidence rates for schizophrenia, while considerably lower than the prevalence rates, seem largely of the same order of magnitude (Dunham, 1965).

The Center for Studies of Schizophrenia (1972) reports that more than two million Americans at one time or another have suffered from schizophrenia. They further estimate that two percent of the United States population will have an episode of schizophrenia some time during their lives; in certain settings, such as the urban slum, the prediction rises to six percent, or more than 1 in 20 persons. Lemkau & Crocetti (1958) believe that the general incidence for schizophrenia can hardly be less than 50 cases per 100,000 population per year, but in all probability, this figure does not exceed 250. A figure most likely to be least in error would be approximately 150 cases per 100,000 population per year. At any given time, there are probably 290 cases per 100,000 population, 150 of whom will be hospitalized. It is probably that for each 1,000 children born, between 14 and 20 will be hospitalized due to schizophrenia sometime during their lifetime. Table 3-3 summarizes the results of several American incidence studies.

In an analysis of the various studies of the incidence and prevalence of schizophrenia, Dunham (1965) drew the following conclusions:

1. Prevalence rates for all types of mental disorders not only show great variations, but are extremely high. Some studies indicate that

## TABLE 3-3

## THE INCIDENCE OF SCHIZOPHRENIA*

| Source | Date | Rate |
|---|---|---|
| Faris & Dunham, Chicago | 1931-1933 | .32 |
| Cohen & Fairbank, Baltimore | 1933 | .47 |
| Malzberg, New York | 1935 | .30 |
| Lemkau, Baltimore | 1936 | .38 |
| Hollingshed & Redlich, New Haven | 1950 | .30 |
| Jaco, Texas | 1951-1952 | .35 |
| Hollingshed & Redlich[1] | 1957 | .31 |
| Taube & Rednich, Md. | 1969 | 2.37 |
| Taube, Washington, D.C. | 1971 | 2.58 |

* All rates per 1,000 population

[1] Average of six studies

approximately one-third of a population is psychiatrically impaired.

2. Prevalence rates for total psychoses in the various studies are far more consistent with one another than are the rates for total mental disorders.

3. Prevalence rates for schizophrenia in American and Asian studies are quite comparable, while European studies show a much greater variation.

4. Incidence rates, as reported in eight American studies, show much greater variation for total psychoses than for schizophrenia.

5. Studies indicate show that the true incidence rate for schizophrenia is probably close to .5 per 1,000 general population, while prevalence rates vary greatly.

6. Studies reporting incidence rates for schizophrenia in different community and social class structures demonstrate contradictions in their findings.

7. Numerous conceptual frameworks for viewing mental illness are tied to differing conceptions of the interrelationship of the individual and society (Dunham, 1965, p. 28).

Compounding problems in estimating true prevalence of schizophrenia on the basis of hospital admissions and patient care episodes is the trend away from institutionalization. 1970 and 1971 are the first two years on record in which the number of releases has exceed the number of admissions in mental hospitals (Bethel & Rednick, 1972). This marked increase in number of discharges reflects a trend toward decreased use of long-term inpatient treatment facilities and increased reliance on short-term facilities such as community mental health centers and psychiatric wards in general hospitals. There is also evidence that there has been a progressive shortening of the hospital stay in many mental hospitals. Some hospitals show that three out of four schizophrenic patients under twenty years of age are discharged within a year of admission. Six out of ten patients between the ages of twenty and fifty and one third of those fifty years of age and over are often discharged within the same amount of time (Gunderson, et al., 1974; Lemkau & Crocetti, 1958).

Costs. Cost figures for schizophrenia and other mental disorders are usually incorporated within the general heading, cost figures of mental illness. Although there is sufficient data on mental illness costs, extremely little information is available on costs specifically related to schizophrenia. The costs for loss of productive capacity accounts for approximately four-fifths of the total costs of mental illness and includes loss of market output (gross national produce), loss of homemaking services and loss of unpaid work. Additional costs to the nation incurred by mental illness concern research and prevention monies. In a National Institute of Mental Health report (Segal and Kety, 1964), the amount of money awarded in research grants for the study of schizophrenia was reported to be $54,019,379 for the years 1948-1963. There were a total of 1,849 grants which constituted 21% of the total number of grants awarded, and 27% of the total amount of money awarded to researchers. Thus a substantial portion of the research and development grants awarded by the federal government have been directed towards the study of schizophrenia. The costs of income maintenance and loss of income attributable to schizophrenia, however, are much higher. Hoch & Zubin (1966) estimated the cost of maintenance and income loss due to this disorder at $660 million per year. Forty-three percent of the total cost of mental illness paid by the general population is in the form of reduced tax revenues, income maintenance to afflicted persons, and expenses incurred for prevention (Conley, et al., 1974).

## III. Demographics

Age: Most studies indicate a rather low number of cases of schizophrenia occurring before the age of 18. After the 18 year category has been passed, however, there is a dramatic increase through the 18-44 age groups, then a decline beginning with 45-64 age group, reaching a relatively low level in the 65 and over category (Taube & Rednick, 1971, 1973; Cannon, 1970; Taube, 1973).

Salzinger (1973) found that of all first admissions to all state hospitals in his study, schizophrenia was found to be most prevalent among the 15-44 age groups with a median age of 33 years, compared to a median age of 51 for all other types of admissions.

Sex: Overall, females appear more susceptible to schizophrenia than are males, though this demographic variable is somewhat age dependent. For example, two studies (Cannon, 1970; Taube, Statistical Note #72) found that females exceeded the number of schizophrenic males in all age groups except in the 17 and under and 18-24 age groups. In a 1971 study of patient care episodes, Taube found that females exceeded males in the 25-44 and 45-64 and 65 and over age groups, while males were more prevalent in the under 18 and 18-24 category.

In a 1969 study of new additions, Taube & Rednick (1973) found that female rates of additions exceeded male rates in the middle age groups (25-44 and 45-64), whereas male rates exceeded female rates in all other age groups. The same investigators, in a study of patient care episodes, found the overall rate about equal for both sexes, but in the under 18, 18-24, and 65 and over ranges, male rates exceeded females, whereas in the middle age groups the reverse is true. Several studies have reported overall higher rates for females (Taube, Statistical Note 41, 48, 72; Bremer, 1951; Brugger, 1931; Helgason, 1964). While discharges from psychiatric inpatient units were found by Taube (1973) to have more cases of diagnosed schizophrenia among males, other studies have found no clear differences according to sex (Dohrenwend & Dohrenwend, 1969).

Race: Higher admission rates to State mental hospitals for non-whites have been noted in several studies. Pollack (1925), in an analysis of the 1923 Federal Census of the institutionalized population, noted that the rate of first admissions among Blacks was higher than that among whites in all the geographic regions except the South Atlantic, East South Central and West South Central. In all the Northern States, except New Hampshire and Vermont, which had a very small Black population, and Minnesota and Missouri, the rate of first admissions was higher among Blacks than among whites.

More recent data from Maryland for the fiscal year, 1968, show that the non-white admission rate for the state's mental hospitals was over twice the white rate; the non-white rate was in excess of the white rate in all diagnostic categories for both males and females (Taube, 1969).

These studies and others (Cohen, et al, 1939; Rosanoff, 1917; Hyde & Chisholm, 1944) indicate that minority groups are more susceptible to schizophrenia than is the white or Anglo majority. This conclusion should be tempered, however, as these differences are probably related to a number of factors such as educational level and marital status, known to influence admission rates to state and county mental hospitals. The availability of mental health care due to social and economic factors also affects these admission rates. There also exists differences among socioeconomic subgroups in the perception and recognition of mental illness, and varying attitudes toward treatment also affect admission rates (Taube, 1969).

Though overall rates appear to be higher among minority groups, Jews have been found to have a lower prevalence of schizophrenia. Malzberg (1931, 1936) has reported that in three studies, overall admission rates for non-Jews exceeded that of Jews.

Socioeconomic Status: Hollingshead & Redlich (1958) report that there exists a definite association between social class and being a psychiatric patient--the lower the class, the greater is the proportion of patients in the population. Furthermore, Vail, et al. (1966) found that the socioeconomic status of a county accounted for 49% of the variance in the rate of mental illness, whereas other variables contributed relatively little. In the lowest social class, rates of schizophrenia are about 11 times higher than the incidence in the higher classes (Clark, 1947; Dunham, 1947; Hollingshead & Redlich, 1953; Scott, 1958). Also high rates of schizophrenia have been found to correllate positively with low-rental, disorganized communities and unskilled occupational categories (Weinberg, 1960).

Urban-Rural Residence: In light of the above, higher rates of schizophrenia have been found, not surprisingly, among persons living in urban, especially central city, areas where there are lower socioeconomic neighborhoods.

## IV. Etiology

There is no known single cause of schizophrenia. No abnormal genetic, chemical, or social factors have been isolated that seem, in and of themselves, capable of producing schizophrenia. Most scientists agree that schizophrenia is caused most likely by a combination of factors (Center for Studies of Schizophrenia, 1972). The current concepts of etiology can be arranged into two principal categories: 1) that schizophrenia assumes the nature of a distorted reaction pattern originating from certain experiences and situations in early life; and, 2) that the disorder is predetermined by hereditary and other constitutional conditions of known origin which predispose the individual to schizophrenia when confronted with stressful situations (Lewis, 1966).

Siva Sankai (1969) has organized the many competing etiological theories in the following manner:

I. Overt biological disease
    A. Leading primarily to psychobiological dysfunction
    B. Leading secondarily to psychobiological dysfunction
II. Subclinical abnormalities
    A. Ordinary stress leads to psychiatric dysfunction
    B. Abnormal stress leads to psychiatric dysfunction
III. Genetic abnormalities
IV. Defective embryogenesis

A genetic predisposition on a polygenic basis is assumed in all the above categories (Siva Sankai, 1969, p. 143).

In the past, it was believed that schizophrenia had a very strong hereditary basis. More recently, however, increasingly sophisticated twin and adoptive research has led to a reassessment of the role of genetics in schizophrenia. Most researchers would probably agree that there is a hereditary aspect of the disorder, but the extent to which it influences the etiology of schizophrenia needs further explanation. It is generally agreed that schizophrenia itself is not inherited. Many scientists, however, suggest that what is inherited is a disposition for the disorder. It is not known whether such a predisposition is specific to schizophrenia or to a broader category of mental illness. Also unknown is the magnitude and mode of genetic influence on the development of schizophrenia. Researchers are, however, reasonably sure that inheritance is not the sole factor (Center for Studies of Schizophrenia, 1972).

Conditions associated with poverty may be implicated in the development of schizophrenia, though poverty itself is not considered to be a direct cause. Schizophrenia does appear to occur more frequently in the lowest socioeconomic classes. Low income mothers often receive inadequate care during the prenatal period and at the time of delivery. They are also more likely to receive poorer care both for themselves and their baby immediately following birth. Poor nutrition and and inadequate care before, during, and after delivery are associated with increased risk for the child. Presumably, one of those risks is the development of schizophrenia (Center for Studies of Schizophrenia, 1972).

Some researchers relate poverty to schizophrenia in terms of the "drift hypothesis." This hypothesis contends that the disproportionate amount of schizophrenia is due to the downward social mobility of schizophrenics, who, because of their illness, are unable to remain within their classes of origin (Goldberg & Morrison, 1963; Wechsler & Pugh, 1967). This downward drift in social mobility has been generally shown to be intergenerational, as measured by the discrepancy between parents' and offspring's occupational levels, and intragenerational, in that in contrast to normals of compatable educational levels, the schizophrenic would not have attained the same occupational level Goldberg & Morrison, 1963). A possible explanation for these differences is the existence of important class differences in how effectively people deal with stress. It is possible that lower class membership limits an individual's internal resources and coping skills by transmitting through the family a certain rigidity in orientation and a distrustful, fearful and fatalistic outlook. It is assumed that these social class variables interact with a genetic predisposition in producing schizophrenia (Kohn, 1972).

Poverty is also accompanied frequently by a disordered family life. For a growing child, this presents serious difficulties in adjustment which could possibly lead to emotional disorder. While broken or otherwise disturbed homes are not in any way the sole cause of schizophrenia, they can contribute in combination with other factors to its development (Center for Studies of Schizophrenia, 1972).

Mechanic (1972) has rejected the notion that there exists a conforming orientation typical of the lower class or for the idea of differential reaction to stress. Dunham (1966) has stated that "it is the nature of the disease that determines the class position of the schizophrenic...it is not the class position that influences the nature of the disorder."

Other sociopsychological hypotheses that have been formulated to explain schizophrenia include the idea that it is a specific reaction to an extremely severe condition of anxiety which has been initially experienced in childhood and which has become reactivated in subsequent years by overwhelming trauma (Arieti, 1955; Bellak, 1948). Deveraux (1939) has suggested that schizoprhenia is a result of distortions and misinterpretations of interpersonal meanings which culminate in disorientations to, and private versions of, culture. Farris (1952) hypothesized that schizophrenia is a severe reaction to prolonged isolation from intimate social contacts.

At the present time, no biochemical cause has been found for schizophrenia. A number of biochemical abnormalities, however, have been reported. Biochemical studies include chemical factors in carbohydrate metabolism, toxicity of body fluids, indole bases and acids, neuramic acid, and tryptophane metabolism. Drugs producing model psychoses are apparently linked to enzyme systems in the brain, but to date, test results are scattered. However, there are certain trends in the results showing similarities sufficient to suggest that a biochemical factor (or factors) is involved in schizophrenia (Lewis, 1966).

Many acutely ill patients excrete in their urine a compound which, when subjected to special chemical analysis, produces a pink spot. The substance which produces the pink spot is of special interest because of its possible hallucinogenic qualities. It is not known whether the substance which produces the pink spot is found only in schizophrenics or whether it is a cause or a result of schizophrenia (Center for Studies of Schizophrenia, 1972).

Many clinicians have identified the family as the source of schizophrenia (Buss & Buss, 1969). Some studies have shown that in families with schizophrenic offspring, communication among family members is often unclear and contradictory. Often the parents themselves exhibit illogical thought processes. However, it is still not known whether these difficulties are a cause or a result of schizophrenia. It is possible that the unclear thinking and abnormal communication patterns in families with schizophrenic offspring may come about as a result of its schizophrenic member (Center for Studies of Schizophrenia, 1972).

Other researchers believe that emotional conflicts within the family can be sufficiently traumatic to cause schizophrenia. Lidz, et al.,(1958) have stated that schizophrenia is most likely a combination of both poor communication and familial conflict:

> The schizophrenic patient is more prone to withdraw through his symbolization of reality than other patients, because his foundation in reality is precarious, having been raised amidst irrationality and chronically exposed to intra-familial communications that distort and deny what should be the obvious interpretation of the environment, including the recognition and understanding of impulses and the affective behavior of members of the family (p. 307).

Bateson, et al. (1956) have proposed a theory of the family as the cause of schizophrenia called the "double bind" hypothesis. The basic assumption is that the mother places here child in a double bind. The child approaches the mother in order to satisfy his need for love and nurturance. The mother simulates affection but rejects the child whenever she is approached. An approach-avoidance situation occurs with the child being confronted with the opposed messages of love and hostility. The mother's denial of hostility worsens the situation by providing a model of irrationality. The child has no responses available that allow him to succeed in obtaining the love and nurturance he needs, and consequently, he may take refuge in denial, fantasy, and irrationality (Buss & Buss, 1969).

Clinical observations have provided evidence which appears to support the double bind hypothesis, but the lack of adequate control groups has left the question of whether the double bind situation is unique to families of schizophrenics still unanswered. Another difficulty is in separating the possible hereditary vs. environmental factors. It has been suggested that a mother who places her child in a double bind may also pass on a hereditary predisposition to schizophrenia. Validation of the double bind theory would open up possibilities for the prevention of schizophrenia. It would be conceivably possible to detect mothers (or perhaps fathers) who precipitate a double bind situation in the home. Once detected, the child could be removed to a foster home where he would never learn the patterns of irrationality that presumably lead to schizophrenia. Relationship psychotherapy might also prove to be effective in the cure of schizophrenia (Buss & Buss, 1969).

Geneological studies have been utilized to study the etiology of schizophrenia. Studies of this kind most frequently start with schizophrenic index cases. It has been shown, by means of such studies, that relatives with genetic endowment more similar to the index cases have higher rates of schizophrenia than relatives with less similar genetic endowments. A 1938 study by Kallmann of 1,087 schizophrenic index cases found that the concordance rate for children of these cases was 14 percent, whereas the rate for grandchildren was only three percent. These findings were interpreted by Kallmann and others as implying a genetic factor in the determination of schizophrenia. It must be pointed out, however, that the results are inherently ambigous in that relatives with greater genetic similarity also ordinarily share more social experience with the index cases. There is more direct influence of the parent index cases on their children than that of the grandparents on their grandchildren. Also operating is a common exposure of both parent and offspring to a schizophrenic environment. These two conditions are probable explanations for the higher rate of schizophrenia among children of schizophrenic index cases. The environmental considerations do not necessarily invoke genetic factors to explain the concordance between children and grandchildren of schizophrenic index cases. On the other hand, the plausibility of the environemental explanations does not preclude a genetic hypothesis (Buss & Buss, 1969).

Other investigators have undertaken the study of monozygotic twin pairs in an effort to avoid this confusion of social and genetic factors that poses such problems in geneological studies. While Kallmann (1946) found a value of 86% concordance between schizophrenic index cases and their monozygotic twins, other researchers have reported much lower rates. The range of concordance rates in several studies reviewed by Dohrenwend and Dohrenwend (1969) was quite broad, with a low of 6% and a high of 71%. Kallmann's (1946) data has been critized in that he drew heavily on the chronic hospital population. Other researchers who selected their samples so as to secure a greater number of less severe index cases have obtained lower concordance rates (Kringlen, 1967; Gottesman & Shields, 1966).

More recent studies which have generally been based on more representative samples of twin pairs have produced relatively low concordances. Though differences in the rates of concordance across studies have not been adequately explained, it is thought that the later studies probably represent corrections of earlier overestimates. In most studies, however, the concordance for monozygotic twins, no matter how low, is significantly higher than the rate for dizygotic twins (Kringlen, 1967).

Underlying the comparisons made between concordance rates for monozygotic and dizygotic same-sexed twins is the assumption that the extent of common social experience is the same for both types. Though studies of the habitual activities of monozygotic and dizygotic twin pairs indicate greater similarity of experience for the former, the discrepancy between environmental similarity scores does not seem large enough to account for the differences in concordance rates (Kety, 1965).

That both environemntal and genetic factors are involved in the etiology of schizophrophrenia is implied by the results of the twin studies. However, many investigators continue to question whether a genetic factor is involved at all (Meehl, 1962). Despite the rather impressive statistical evidence provided by the twins studies, Jackson (1960) has pointed out that there is still doubt as to the adequacy of the controls for nongenetic factors. He feels that "possible environemntal causes and particularly psychic identification have been ignored in favor of possible genetic causes."

Though concordance rates for monozygotic twins are difficult to explain without assuming a genetic factor, even the highest rates do not suggest the possibility of 100 percent concordance. The implication, therefore, is the existence of a predisposing genetic endowment upon which environmental influences act in a precipitating manner (Dohrenwend & Dohrenwend, 1969).

Dohrenwend & Dohrenwend (1969) reviewed three types of studies which were aimed at determining the relative importance of hereditary and social-environmental factors in the etiology of schizophrenia. One type of study, which involved foster children who were either schizophrenic or had schizophrenic mothers, concluded that the overall results favored a genetic etiology, but it was also pointed out that the studies had limited generality. Another type of study has involved the investigation of the social mobility history of lower class cases in relation to the presence of psychological disorders, usually schizophrenia. Methodological problems in the measurement of social mobility have been encountered in these studies, and most of them have failed to provide information about family history with respect to psychological disorder. Due to these problems, their results remain inconclusive with regard to etiology (Dohrenwend & Dohrenwend, 1969). The third type of study involved the higher rate of hospitalized cases of schizophrenia among Norwegian immigrants when compared to the native Norwegian popuation (Odegaard, 1932). In interpreting the results, the author emphasized genetic etiology. He considered constitutional factors more important, and stated that there was no indication that the hardships of immigrant life had played any part in the development of schizophrenia in his sample.

Odegaard's (1932) results have not been supported by subsequent studies. For example, in some studies immigrant groups have been found to have a lower rate of treated psychological disorder when compared to nonimmigrant populations (Murphy, 1965). Environmental factors have also been found to explain the higher incidence of schizophrenia among immigrant groups just as plausibly as the presumed "selected migration of the genetically handicapped" (Malzberg, 1940).

Although the results of the environmental studies do not rule out the possibility of social factors being involved in the etiology of schizophrenia, the indicate, what, from the genetic point of view, may constitute "environmental bad luck" (Dohrenwend & Dohrenwend, 1969, p. 36). There are varying interpretations of the assumed interaction between heredity and environment (nature/nurture).

From a geneticist's viewpoint, the interaction is explained in terms of the penetrance of a gene for a disorder; that is, the probability that a person carrying the gene will develop the disorder. Estimates of penetrance, however, show considerable variation, both by type of gene (recessive, dominant) and manifestation percentages (Dohrenwend & Dohrenwend, 1969).

There are several theories concerning the inheritance of schizophrenia that specify the precise genetic mechanism. Kallmann (1953) proposes a recessive gene; Böok (1953) suggests a dominant gene; and Weinberg & Lobstein (1943) assume that there is a different gene for each subtype of schizophrenia. None of these have been proven (Buss, 1966). Though the geneticists lean toward the notion of a single gene (recessive or dominant), there is simply not enough evidence to confirm this. Despite the evidence for an inherited component in schizophrenia, the precise mechanism of inheritance is still in doubt (Dohrenwend & Dohrenwend, 1969).

Some support for the biogenesis (genetic) theory of schizophrenia was obtained by Heston (1966) in a follow-up study of children born between 1915 and 1945 to schizophrenic mothers. Follow-up data into adulthood was secured for 47 such children who had been adopted as infants into foster homes where there was no suspicion of schizophrenia. These individuals were compared with a carefully matched control group of children born of non-schizophrenic mothers who had also been adopted in the first few days of life by a matched group of foster parents. The results found that five (16.6%) of the adopted children of schizophrenic mothers and none of the controls had schizophrenic histories at the time of follow-up. Other psychiatric problems were found more often in the former group also. Eight out of 21 of the adopted children of schizophrenic mothers had later records of psychiatric or behavioral discharges from the armed forces, while only one of 17 of the controls had such a discharge record.

Another of the biological approaches to schizophrenia assumes that schizophrenia is caused by an inherited metabolic disturbance. Some support for this theory was provided by Dohan (1966). In a World War II study, he compared per capita wheat consumption of five countries with the number of hospital admissions for schizophrenia during the same period. In the three countries (Finland, Norway, Sweden) whose wheat consumption was reduced by about 50 percent due to shipping shortages, the number of admissions for schizophrenia was also nearly cut in half. In the United States and Canada where wheat consumption did not change, the incidence of schizophrenia remained stable. In another study, Dohan (1968) was able to manipulate schizophrenic's behavior by secretly controlling the glutten in their diet.

Indirect evidence for an inherited metabolic error in the etiology of schizophrenia was provided by several studies linking schizophrenia with celiac disease which is a metabolic disorder involving an unusual sensitivity to wheat and certain germs. On Formosa, natives, who eat very little wheat, have been found to have a rate of schizophrenia one third that of Northern Europe. Schizophrenics are often allergic to wheat and corn (Rimland, 1969).

Most genetic studies imply additional factors besides the gene which determine whether or not schizophrenia will actually develop in a given case. Since the geneticist's conception of nongenetic determinants of a phenotype includes prenatal and perinatal factors, these other factors are not necessarily limited to the social environment (Stern, 1960). A biogenetic disorder is a behavioral disorder resulting solely from the effects of biological factors, including both gene action and the effects of the physical-chemical environment (Rimland, 1969). Pollin, Stabenau & Tupin (1965) in a study of identical twins discordant for schizophrenia, found that schizophrenics were more poorly developed at birth than normal twins. Other investigators have reported that children in a psychiatric hospital were more likely to have been born prematurely than were normal controls (Zitrin, Ferber, & Cohen, 1964).

The genetic studies do not rule out conclusively the possibility of social factors as partial determinants in the development of schizophrenia. On the other hand, although the penetrance of a gene for schizophrenia may be less than 100 percent, this does not imply, at least to the geneticist, a committment to predisposing social factors as partial determinants. The issue becomes more complicated given the existence of genetic studies which found higher penetrances in the lower classes than in the middle classes. Such results indicate, at least tacitly, that social factors may play a role in the etiology of schizophrenia (Dohrenwend & Dohrenwend, 1969).

Many investigators emphasize the importance of social conditions as determinants of schizophrenia. Though the possible involvement of genetic factors in the etiology of schizophrenia is recognized, these researchers believe that genetic endowment plays a relatively minor role in producing the disorder. If the environmental hypothesis is correct, a high prevalence and incidence of psychiatric disorder should be a regular finding in disintegrated communities. Also, psychiatric disorder should be reversible in situations where disintegration is reversed as the response to change becomes more stabilized (Leighton, et al., 1963).

Though social withdrawal is known to be a prominent symptom of schizophrenia, less is known as to actually how or why withdrawal occurs. Faris (1934), in addressing himself to this question, hypothesized that the pre-schizophrenic is a child who has been pushed aside and isolated by the community in which he resides. Being rejected or ignored causes the individual to turn slowly away from social contacts. As social distance increases, the individual orients his attention more and more toward himself, especially his fantasies and his body. Lacking sufficient social contacts by which to check his conceptions of reality , the individual fails to develop normal social roles and adequate communication skills (Buss & Buss, 1969).

Evidence conerning the social isolation hypothesis is controversial. Faris & Dunham (1939) collected data that showed a positive relationship between social disorganization and schizophrenia, but Kennedy (1964) has pointed out that not only are these and other similar findings nor relevant to the social isolation hypothesis, but that there also exist negative findings. A longitudinal study that traces the development of schizophrenia from childhood to the onset of psychotic symptoms is needed in order to adequately substantiate or refute this hypothesis (Buss & Buss, 1969). If true, the hypothesis offers a means of preventing schizophrenia. This would entail the altering of social organization in such a way as to prevent individuals from being rejected and ignored. Exactly how this could be accomplished is not clear. Also, the theory implies that in a state of social disorganization, efforts should be made to detect potential isolates (Buss & Buss, 1969).

The neural theory assumes that the cause of schizophrenia is a malfunction of the nervous system. Meehl (1962) has combined the genetic and neural theories into one single theory. Underlying his speculatons are three basic assumptions: 1) that there is an inherited defect that predisposes an individual to schizophrenia; 2) this defect resides in the nervous system; and, 3) schizophrenia is a disease similar to other biological diseases. Though an inherited defect of the nervous system is the necessary condition in the development of schizophrenia, Meehl does not exclude social-environment factors as partial determinants. An unfortunate early psychological environment may provide the sufficient condition necessary for the disorder to develop. The more severe the inherited defect, the less environmental stress is needed to precipitate schizophrenia (Buss & Buss, 1969).

Other proponents of the neural theory of schizophrenia have studied the dynamics of neural transmission, particularly the neurohumors, the substances or chemicals which underlie neural transmission. Wooley (1962) has proposed serotonin, a brain neurohumor, as the crucial chemical in the development of schizophrenia; too much or too little of this substance can presumably lead to schizophrenia. Another well known neurohumor, adrenaline, was the focus of a study by Hoffer and Osmond (1959). Their theory is that an inherited enzyme defect leads to faulty oxydation of adrenaline and the resulting metabolic imbalance and chemical by-products interfere with brain functioning. Another possibility, suggested by Rubin (1962), is that schizophrenia is caused by any of several kinds of imbalance between sympathetic nervous functioning (mediated by the neurohumor, adrenaline) and parasympathetic nervous functioning (mediated by the neurohumor, acetylcholine).

While the above researchers base their theories primarily on the pharmocological properties of the neurohumors, Meehl (1962) bases his proposal on the relationship between behavior and the nervous system. In locating the neural defect in the individual neurons, specifically in the synapses between the neurons, Meehl's hypothesis is closely tied to research in neuropsychology. Common to both types of neural theories is the assumption that schizophrenia is caused by defective biological processes. Also implied is that specific events and learning in an individual's life which shape the particular content of the psychosis are unimportant in the etiology of the disorder. Thus the neural theories stand in sharp contrast to the environmental theories which emphasize the importance of social influences.

Meehl's (1962) theory suffers from the lack of two kinds of evidence. First, the precise genetic mechanism of schizophrenia still remains to be established; and, secondly, the precise nature of the neural defect is still unknown. If Meehl's theory were proven true, the only real means of prevention would be through eugenics. Schizophrenic individuals would have to be prevented from reproducing in order to secure the elimination of the disorder. Regarding cure, Meehl suggests chemical therapy to restore normal neural functioning, and rehabilitation as would be done with any other neurological condition (Buss & Buss, 1969).

The cognitive approach to schizophrenia focuses on the cognitive and associative dysfunction found in schizophrnenics. It has been suggested that underlying disturbances in cognition and association is a fundamental attention deficit--an inability to maintain a set and keep out distracting stimuli. The normal person will select and mark off boundaries among incoming stimuli, establish similarities among incoming stimuli, and move conceptually from immediate sense impressions to less concrete ideas and concepts. In contrast, the schizophrenic is unable to select, focus on, and regulate incoming information (Shakow, 1963). This inability to cope with distracting elements in the environment causes the individual to become confused and inefficient.

McGhie & Chapman (1961) believe that this primary cognitive deficit may cause motivational and social problems as well. Concerning this idea, Arnold and Buss (1961) remark:

> ...as his cognitive apparatus fails, the schizophrenic's world changes rapidly. He is puzzled and frightened by his distorted perceptions, and, as his anxiety mounts, he avoids all sources of confused perceptions, especially other persons. He attempts to struggle with his problem alone, or at least to avoid the threatening presence of others. Thus the social-motivational aspects of schizophrenia are viewed as deriving from the more fundamental cognitive aspects (p. 13).

Lang & Buss (1965) point out that though evidence for an attention deficit in schizophrenia is strong, McGhie & Chapman's specific theory of the interrelationship of cognitive dysfunction and social withdrawal still has not been proven. Though the cognitive approach to schizophrenia implies neural involvement, it does not specify a particular etiology.

The social censure hypothesis of Garmezy & Rodnick (1959) is based on the assumption that a basic cause of schizophrenia is excessive anxiety. Preschizophrenics are known to be abnormally sensitive to criticism and rejection.

The social censure hypothesis assumes that the fear of rejection causes the schizophrenic to be inefficient, confused and leads him to self-imposed isolation from others.

Mednick (1958) believes that the potential schizophrenic's high anxiety functions as an irrelevant and interfering drive. Utilizing this assumption, Mednick attempted to account for the thought disorder that is characteristic of schizophrenia. Assuming that the schizophrenic is extremely anxious to begin with, he infers that high anxiety (or high drive) leads him to overgeneralization. Excessive anxiety causes more and more stimuli to become increasingly frightening. In order to escape these alarming situations, the schizophrenic lets his attention turn to remote irrelevant thoughts and associations which serve as distractors from anxiety-producing thoughts. Since the reduction in anxiety is rewarding, the tendency to think irrelevantly is reinforced and may become habitual. The theory suffers from a lack of consistent supporting evidence with both positive and negative findings being reported (Buss & Buss, 1969).

Regression, a return to behavioral modes characteristic of earlier developmental stages of life, is the basis of the neopsychoanalytical and comparative-developmental approaches to schizophrenia. Both types of approaches assume that there are fixed stages in the developmental sequence. Every child must master the problems inherent to a given stage of the sequence and then proceed to the next one. The ultimate "goal" in this progression is maturity. Regression indicates an interruption or reversal of this process and causes immaturity and abnormality (Buss & Buss, 1969).

Using Sullivan's neopsychoanalytic views, Kantor & Winder (1959) have related his five stages of early childhood to the process-reactive dimension of schizophrenia. Process or nuclear schizophrenia, is the core schizophrenic psychosis. Characteristically, it has a poor prognosis and considerable psychological deficit. Reactive or atypical schizophrenia, which includes various nonschizophrenic characteristics, has a better prognosis and less deficit (Buss & Buss, 1969). Proceeding from the assumption that within schizophrenia there are variations in the degree of regression, Kantor & Winder (1959) believe that the severer the regression, the more process is the schizophrenia; the milder the regression, the more reactive is the disorder. Though some correlational evidence exists to support the regression hypothesis, longitudinal studies from infancy onward are needed before any concrete conclusions may be drawn (Buss & Buss, 1969).

A more descriptive rather than etiological theory of schizophrenia has been developed by Goldman (1962). Applying Werner's (1948) comparative-developmental approach, Goldman assumes that the developmental stages constitute a progression from an unorganized, undifferentiated, diffuse state to an organized, differentiated, specific state. Essential to this process is differentiation or the development and assimilation of different response modes and their organization into a heirarchy of behavioral tendencies (Buss & Buss, 1969).

Goldman (1962) assumed that schizophrenia represents a regression back to the earliest developmental states—those characterized by diffusiveness and a lack of differentiation. The author tried to demonstrate parallels between the behavioral tendencies of children and schizophrenics, but how close these parallels are is debated (Buss & Buss, 1969).

## V. Life Functions

Mobility. Table 3-4 lists the difficulties the schizophrenic encounters in the life function of mobility. The motor disorder in schizophrenia occurs variously in the forms of (1) catatonic rigidity, that seems to have become a clinical rarity in recent decades; and (2) the use of complicated mannerisms, rituals, and speech changes which do not in and of themselves represent behavioral disturbances (Rosenbaum, 1970).

Kayton (1975) noted that sometimes during the early stages of schizophrenia, patients may curl into fetal positions or huddle in corners. Some subjects in this study demonstrated ataxia and painful muscular rigidity, as well as great strain and feelings of sudden tiredness when reading was attempted. When schizophrenia occurs in infancy there may be a complete lack of muscle tone (Hoffer & Osmond, 1974).

Houston, Shakow & Riggs (1937) found that schizophrenics are slower in responding to stimuli than are normals. This has been interpreted in terms of the concept of set or readiness to respond. The theory states that the schizophrenic suffers from an inability to hold his set longer than a few seconds. However, the general finding that schizophrenics have longer reaction times than normals is correct only under the condition of no feedback (Salzinger, 1973).

Visual changes occurring in schizophrenia may lead to a defect in judging distances which can impair the individual severely in his everyday functioning (Hoffer & Osmond, 1974).

## TABLE 3-4

## LIFE FUNCTION TABLE - SCHIZOPHRENIA: MOBILITY

| Statement of Problem | Dynamics | Source |
|---|---|---|
| Catatonic rigidity | Relatively rare | Rosenbaum (1970) |
| Complete lack of muscle tone | Infancy | Hoffer & Osmond (1974) |
| Unduly high movement | Paranoids | Rosenbaum (1970) |
| Slower in responding to stimuli | In comparison to a normal control group--interpreted in terms of set and readiness to respond; it is thought that the schizophrenic suffers from inability to hold his set longer than a few seconds. | Houston, Shakow, & Riggs, (1937) |
| Curling into fetal position, huddling in corners. | Internal Disorganization Phase | Kayton (1975) |

Health. Table 3-5 lists the difficulties the schizophrenic encounters in the area of health. Kayton (1975) in a study of 13 schizophrenics whose mean age was 20.4 years (11 females, 2 males) found that his subjects expressed excessive concern about food intake with fears and delusions about obesity. Refusal to eat was not uncommon. Schizophrenia may also cause changes in taste leading to food tasing bitter or metallic. Many patients will, as a result, refuse to eat, and suffer malnutrition (Hoffer & Osmond, 1974).

Fatigue, one of the most common changes in schizophrenia, usually comes on slowly and insidiously and is very disabling. During the severe stages of the illness, patients tend to lose weight and become thin and emanciated (Hoffer & Osmond, 1974). Some patients display a reversal of diurnal rhythm with excessive sleeping during the day. Other psychophysiological disturbances are nausea, lightheadness, ataxia and painful muscular rigidity (Hoffer & Osmond, 1974).

A majority of patients develop a vitamin B-3 and B-6 dependency. These vitamins are essential in proper amounts for brain metabolism. A large proportion of chronic schizophrenics are allergic to many common foods, especially dairy products, wheat, and corn. An increased susceptibility to tuberculosis and a slower healing of tuberculotic lesions has been noted in some adult schizophrenics (Hoffer & Osmond, 1974).

There is occasionally a confusion in sexual identity among male schizophrenics. A decrease in sexual interest on the part of both sexes (is concomitant with generalized social withdrawal), changes in the menstrual cycle and impotency and atrophy of the male gonads have also been noted (Hoffer & Osmond, 1974).

When the onset of illness is before puberty, a shortness of stature, and a narrowness in the chest from front to back may occur. There may also be a deformity of shape of the left compared with the right side. If children become ill before their sensory organs reach full functional maturity, their organs may be physically health, but their formation and coordination may be distorted (Hoffer & Osmond, 1974).

Lane & Albee (1966) compared birth weights of adult schizophrenics with those of their siblings. The infant who was later a schizophrenic adult was found to be significantly lower in birth weight than the average of his siblings, even when prematurity and birth order were controlled. Findings on this subject, however, are not consistent (Pollack, et al, 1966).

Schizophrenics have been found to have a significantly lower incidence of diabetes mellitus, cancer, and psychosomatic illness than the general population (Rassidakis, et al., 1974).

## TABLE 3-5

## LIFE FUNCTION TABLE - SCHIZOPHRENIA: HEALTH

| Statement of Problem | Dynamics | Source |
|---|---|---|
| Changes in taste may cause food to taste bitter | Refusal to eat | Hoffer & Osmond (1974) |
| Pronounced fatigure and listlessness | One of the most common changes in schizophrenia. Comes on slowly and insiduously. | -"- |
| Extreme weight loss | Severe stages | -"- |
| Vitamin B-3 and B-6 dependency | Occurs in the majority of patients (are essential in proper amounts for brain metabolism). | -"- |
| Allergic reactions to common foods, especially dairy products, wheat, and corn. | A large proportion of chronic schizophrenics display these reactions. | -"- |
| Reduced birth weight | When compared with siblings, the adult schizophrenic was found to be significantly lower in birth weight. | Lane & Albee (1966);<br>Pollack,et al.(1966). |
| Shortness of stature, narrowness in chest from front to back; deformity of shape of left compared with right side. | May occur if the onset of the illness is before puberty. | Hoffer & Osmond (1974) |
| Increased susceptibility to tuberculosis; slower healing of tuberculotic lesions. | Adults | -"- |
| Impotency and atrophy of the male gonads | Schizophrenic males | -"- |
| Changes in the menstrual cycle. | Schizophrenic women | -"- |
| Decrease in sexual interest | Both sexes | -"- |
| Reversal of diurnal rhythm | Post Psychotic Regression | Kayton (1975) |

Communication. Most clinical psychiatrists would agree that many, but not all, schizophrenic subjects show abnormalities in the field of language (McGhie & Chapman, 1961). The qualities in the schizophrenic's speech that seem most obviously different from normal speech are a "wandering" quality in which open-ended questions result in free-associative over-inclusive monologue, and the personalized use of symbols so that the usual symbol-referent tie is distorted. Many schizophrenics use neologisms, i.e., new words for old referents, and some chronic patients talk in a more or less private language which at times degenerates into a word salad. Schiozphrenics may also use alliteration and condensation (McGhie & Chapman, 1961).

Sommer, et al., (1960) investigated whether there was a speech form common to all schizophrenics, but came to a negative conclusion, indicating that individual schizophrenics are highly idiosyncratic in their language use and likely have great difficulty understanding each other.

Most investigations of language inescapably deal with thought to some degree. Some authors seem to regard the perceptual defect leading to disordered thinking as the primary mechanism. Two main varieties of thought disorder have been noted: the failure to sustain logical thought for more than a few seconds and the sustained but unintelligible flow of thought (as in words). It is thought that the first variety depends on a failure of the perceptual process, and that the latter depends on a failure of the representation process, or the failure to use verbal symbols in relation to their normal referents (Davie & Freeman, 1961).

Ferreira (1960) suggests that schizophrenics alter the symbol-referent tie because of the uneven and assymmetrical relationship with the mother-figure, about which relationship the schizophrenic is forever speaking. The schizophrenic censors his messages so that no element of his wish for autonomy or anger at the mother-figure is revealed. The schizophrenic creates a language foreign enough not to be understood and private enough to allow him the expression of some feelings.

One of the central problems for the schizophrenic is that he is deficient in internal objects. Szasz (1957) has suggested that there is a parallelism in the growing child between the development of object relations and the increasing capacity for abstraction. The formation of internal objects favors the process of symbol formation, and allows the ego to deal with external objects not only as "immediate objects" but also as abstractions, represented by symbols. Schizophrenics may not treat symbols as abstractions but rather regard them as concrete, real objects.

Several investigators have studied the schizophrenic's use of abstract and concrete responses. In a 1971 study, Forrest, Hay & Kushner administered a verbal test aimed at discriminating between concrete and abstract responses to twenty-five normals and twenty-two schizophrenic subjects. The results suggested that the capacity to respond abstractly was related to intelligence, and not to diagnostic category.

In a 1953 study, Baker found that schizophrenics manifested significantly higher concreteness in language aptitude. He concludes that the level of language function in the schizophrenic bears a closer similarity to that of the young child than it does to that of the normal adult.

Forest, et al. (1971) further believes the schizophrenic's disturbed speech is somehow related to abnormal learning experiences in the families where communication is often devious and contradictory. They also believe that schizophrenic speech is often associated with a relative deficiency in the abstracting function and has an overinclusive quality. They go on to say that the degree of ego organization may be the intermediate mechanism which underlies the defect in the abstracting function. Davie and Freeman (1961) also consider the patterning of perception an ego function. If the capacity to abstract is related to "ego strength," then such a deficiency should be expected in psychopathic personality disorders. Forrest, Hay & Kusner (1971) also believe that the schizophrenic's disturbed speech has a defensive, personalized quality. They conclude by stating that the schizophrenic's speech disturbance is psychogenic in origin rather than representing an organic deterioration. This point of view is based largely on observation that the speech disturbance, to some extent, can be switched on or off, depending on the questions and the context (Szaz, 1957).

Several researchers have confirmed the hypothesis that the schizophrenic has an unstable perceptual organization which can easily be overloaded by incoming signals because of a relative failure to monitor out irrelevant signals (Johannsen, et al., 1964; Weckosicz, 1957; Bannister, 1963).

Using a newly-devised scoring system of the Rorschach responses which tests for "perceptual structuralization," Friedman (1953) found that his group of schizophrenics showed a "genetically lower level" in the structural aspects of their perceptions. The responses of the schizophrenics were found to be similar to those of children. Using a similar scoring technique, Siegel (1953), found that a paranoid schizophrenic produced responses which indicate "a combination of genetically early and genetically late characteristics." Both of these studies provide some support for the regression hypothesis in schizophrenia.

By means of a sentence-completion test, Ellsworth (1951) compared a group of schizophrenics with a normal control group and several groups of normal children representing various age levels. Significant differences were obtained between the schizophrenic and the control group, but no significant differences were found between the schizophrenic and a 5th grade group. As measured by parts of speech, the two groups were quite similar. The author, stressing the importance of socialization with respect to his findings, attributes the similarity in language content to the non-orientation of both groups with regard to consensual reality.

The ability to perceive human movement, considered to require the highest degree of perceptual differentiation and the ability to empathize with others, has been found to be lacking in the schizophrenic, but overly employed in the paranoid. The paranoid is constantly looking for external cues to which he may respond defensively. Interpersonal withdrawal of the schizophrenic is manifested, on the Rorschach, in his not seeing people (Rosenbaum, 1970).

Word association enters into the definition of thought disorder as a process of disassociation. It should, however, be construed as a change in what is associated rather than a lack of association. This change in what is associated results in the schizophrenic's greater number of idiosyncratic responses (Deering, 1963; Johnson, Weiss & Zelhart, 1964; Moran, Mefford & Kimble, 1964; Sommer, Dewar, & Osmond, 1960; Storms, Froen & Lovin, 1967). Schizophrenics have also been found to demonstrate more instability in their word associations from one day to the next (Storms, Froen & Lovin, 1967). The finding that schizophrenics have longer latencies than normals is attributed to a conflict among different potential responses to a stimulus word. Longer response latency reflects the fact that such conflict produces vacillation (Faibish, 1961).

Using a communication task, Cohen & Camhi (1967) investigated the way schizophrenics regulate their verbal behavior through the use of word association. Results indicated that schizophrenic listeners are as good as normal listeners, but schizophrenics are less effective in communicating the right kind of clue than normal speakers.

There is considerable evidence that shows that there is a significant correlation between length of hospitalization time and reduction in the number of associations shared with a normal group. Wynne (1963), in a cross-section study, matched two groups of male schizophrenics on a number of factors. The two groups had been hospitalized 2.5 years and 14.4 years respectively. Using a free association test, he obtained a significant decrease of primary responses and an increase of individual responses in the long time group compared to the short time cases. However, Moran, et al. (1960) retested a group of 30 chronic shcizophrenics after a period of six years. The responses on a free association test were scored on conceptual relatedness to the stimulus words. Comparison of test and retest scores yielded no significant differences in performance, nor was there any significant difference between the number of patients doing better and worse on the retest, compared to their performance on the first test.

Flekkoy, Astrup & Hartmann (1971) conducted a longitudinal study of changes in associative performance of 47 chronic schizophrenics over a 10 year period. Their performances were scored according to the following categories: associations of good quality (higher associations), primitive associations, incoherent associations, echolalia, multiword responses, wrong reproductions, and reaction time. The main results included: a significant increase in the number of higher associations and a decrease in echolalic responses and wrong reproductions. On the other categories there was a tendency towards improvement, except for multiword responses, which showed no difference on test and retest. Chronological age was positively and significantly correlated with increase in number of echolalic responses and increase in mean reaction time. Improvement was found to be most marked among the paranoid schizophrenics, but there was a general trend toward improvement within the catatonic and hebephrenic groups as well. Patients who had had more than 9 years of school showed more improvement than patients having less education.

As a final word on the subject of association, it should be noted that Yates (1956), in a review of the literature from 1939 to 1955, concluded that the performance of schizophrenics on verbal tests declines with increasing hospitalization time.

Hammer & Salzinger (1962) examined the extent to which schizophrenics shared the same vocabulary with normals. Results showed more sharing of vocabulary among normals than either among schizophrenics or between schizophrenics and normals.

When asked to interpret proverbs, the schizophrenic often gives responses that are highly personal and idiosyncratic or bizarre in nature. He may attribute a private meaning to the proverb (Rosenbaum, 1970). On the Rorschach, and TAT, the schizophrenic displays a very low percentage of popular responses and an inability to perceive the common, popularly conceived percepts. He may also manifest peculiar verbalizations, cryptic explanations, vague generalizations, nonsequitors, autistic logic, and omission of ideas necessary for story coherency and continuity. The paranoid schizophrenic may be overcautious in elaborating a story, and vague or evasive in specifying details (Beck, 1968; Klopfer, 1956; Rickers-Ovsienkina, 1938; Rorschach, 1943; Schafer, 1948; Rosenbaum, 1970).

Schizophrenics have been found to be more repetitious in their speech than normals (Whitehorn & Zipf, 1943; Mann, 1944; Fairbanks, 1944; Seth & Beloff, 1959). They have also been found to have a higher verb-adjective quotient than do normals (Mann, 1944; Fairbanks, 1944). This has been interpreted to mean that psychological abnormality increases the use of "activity" (verb) language and reduces the use of "qualitative" (adjective) language (Grengelmann, 1961). Schizophrenics have been differentiated from normals in terms of such characteristics as a larger number of remote responses and fewer first responses when Skinner's (1936) verbal summator was used (Shakow, Rosenweig & Hollander, 1966).

Some schizophrenic patients demonstrate what has been termed an "Opposite Speech" syndrome (Laffal, Lenkoski & Ameen, 1956). This syndrome is basically a reversal in certain language uses, especially in the use of "yes" and "no." It has been theorized that opposite speech copes with the hostile impulses by disrupting communication and rejecting other people or by allowing the "verbalization of ideas which the patient consciously rejects" (Laffal, Lenkoski & Ameen, 1956).

Many schizophrenics suffer from hallucinations. These have been shown, by evidence from various sources, not to result from auditory imagery, but to be caused by subvocal, whispered and sometimes even shouted speech by the patient himself (Gould, 1948, 1950). By measurement of the muscle potential from the vocal organs, Gould (1948, 1950) found that 80% of his schizophrenic subjects suspected of hallucinating demonstrated increased muscle potential, while 90% of a group of patients without hallucinations showed no increase in muscle potential. Patients have been known to spontaneously describe their hallucinations as being related to their own speech. They sometimes report that the voices they hear come from their own mouths first. Observations by other people have reported that hallucinating patients can be observed to move their lips and whisper to themselves during hallucinations.

The families of schizophrenics have been found to show abnormalities in communication. They often demonstrate defects in maintaining sets of meaning and attention difficulties in describing and communicating percepts and "closure problems," characterized by gross indefiniteness, unstable percepts and unintelligible remarks (Singer & Wynne, 1966; Singer, 1967). On the Rorschach and the TAT, families of schizophrenics have demonstrated peculiar language and logic. They may use ordinary phrases and words oddly or out of context, utilize odd sentence construction, and manifest illogical combinations of percepts and categories, containing nonsequitor reasoning (Singer, 1967).

Cognitive Intellectual. There is no universality in diagnosis of schizophrenia, and investigations have not been able to agree on which patterns are characteristic of schizophrenia. In research with the Wechsler-Bellevue, group differences in test patterns of scatter between schizophrenics and other conditions have been obtained, but they remain inadequate for individual diagnosis. The basic problem is the lack of criterion of schizophrenia. Staffs in different hospitals appear to utilize different criteria for their diagnosis and consequently, differences between groups of schizophrenicsresult. Other problems accounting for a good deal of inconsistency of the findings concerning schizophrenic intellectual patterning are methodological flaws such as inadequate control for a number of relevant factors (age, sex, length of hospitalization, etc.). Since test scatter and various formulae for indices of deterioration, which

## TABLE 3-6

## LIFE FUNCTION TABLE - SCHIZOPHRENIA: COMMUNICATION

| Statement of Problem | Dynamics | Source |
|---|---|---|
| Auditory Hallucinations | Caused by patient's subvocal, whispered, or shouted speech | Gould, 1948, 1950 |
| Increased muscle potential in vocal organs | Occurs more often among schizophrenics than normals | Gould, 1948, 1950 |
| Language content similiar to 5th graders when measured by parts of speech. | Schizophrenics are thought to be nonoriented with regard to consensual reality. | Seth & Beloff, 1959 |
| Instability in word associations from one day to the next | | Storms,Broen & Levin, 1967 |
| Longer latency responses | Ascribed to conflict among the different potential responses to stimulus word; such conflict produces vascillation. | Faibish, 1961 |
| Peculiar verbalizations, cryptic explanations, vague generalizations, nonsequitors, omission of ideas necessary for story coherence and continuity | Incipient schizophrenic disturbances as manifested on the TAT. | Schafer, 1948 |
| Significantly higher concreteness in language aptitude | | Baker, 1953<br>Szasz, 1957 |
| Reduction in number of associations shared with normals; declining performance on verbal tests; decrease in primary responses and increase in individual responses. | Has been correlated with length of hospitalization time. | Shakow, Rowenwieg, & Hollander, 1966<br>Higgins, et al, 1965;<br>Yates, 1956; Wynne, 1964 |
| "Opposite Speech" syndrome or a reversal of certain language uses, especially in the use of "yes" and "no". | It has been suggested that opposite speech copes with hostile impulses by disrupting communication or by allowing verbalization of ideas the patiently consciously rejects. | Laffal, Lenkoski & Ameen 1956 |
| Use of Neologisms: use of new words for old referents | Present in some but not all schizophrenics | McGhee & Chapman, 1961 |
| Talking in a private language | Chronic patients especially | McGhee & Chapman, 1961 |

TABLE 3-6 cont'd.

| Statement of Problem | Dynamics | Source |
|---|---|---|
| Use of alliteration, condensation, over-inclusiveness and personal distortion of the symbol-referent tie. | Characteristics of schizophrenic's verbal productions | Ferreira, 1960 |
| "Wandering" quality of speech | Open-ended questions result in free-associative, overinclusive monologue | McGhee & Chapman, 1961 |
| Obscurity in speech-disjointedness in the communication of meaning and/or affect. | Has a purposive, defensive function. | Ferreira, 1960<br>Schafer, 1948 |
| Difficulties in perception of spoken speech | Unstable perceptual organization; relative failure to monitor out irrelevant communication signals | Johannsen, etal, 1964; Weckowicz, 1957; Bannister, 1963; McGhie & Chapman, 1961. |
| Tendency toward repetitous speech | Repeat more and have shorter distance between repetitions than normals. | Whitehorth & Zpif, 1943; Mann, 1944; Fairbanks, 1944 |
| Increase in verb language and reduction in qualitative (adjective) language | Schizophrenics have a higher verb-adjective quotient | Mann, 1944; Fiarbanks, 1944; Brengelmann, 1960 |
| Difficulties in perceiving human movement | Is either lacking in the schizophrenic or overly employed in the hypervigilant paranoid. | Rosenbaum, 1970 |
| Staring and diminished or staggered frequency of blinking | Post-Psychotic Regression Phase | Kayton, 1975 |
| Muteness | May occur in Internal Disorganization Phase | |
| Figure-ground blurring (Impairment of Cognitive Focusing) | Manifested on Rorschach by a failure to differentiate space from gray or colored aspects | Weckowicz, 1960 |
| Difficulties in describing and communicating percepts | Families of schizophrenics | Singer & Wynne, 1966 |

TABLE 3-6 cont'd.

| Statement of Problem | Dynamics | Source |
|---|---|---|
| Idiosyncracy of speech | There is more sharing of vocabularly among normals than among schizophrenics or between schizophrenics and normals. | Hammer & Salzinger, 1964 |
| Greater number of remote responses and fewer first person responses | Manifested on Skinner's (1936) verbal summator | Shakow, Rosenweig, & Hollander, 1966 |
| Defensive, personalized quality of speech | Is related to abnormal learning experiences in families of schizophrenics where communication is often devious and contradictory | Szasz, 1957 |
| Schizophrenic speech disturbance | Present in many, but not all schizophrenics. Psychogenic in origin. Can be switched on and off to some extent | Szasz, 1957 |

are special variations of the scatter theme, have failed to distinguish reliably between a variety of disorders such as mental deficiency, neuroticism, organicity, and others, no characteristic pattern of schizophrenic mental functioning has been established (Boehm & Sarason, 1947; Rappaport, 1951, 1953).

Some researchers, however, have isolated certain cognitive diagnostic factors. These cognitive symptoms of schizophrenia include: disturbances of language and thought; distortions of the body image; a retreat from reality to fantasy; hallucinations, and delusions (Weinberg, 1960). Other diagnostic signs are a confused, often scattered, inefficient cognitive functioning. This is in contrast to the normal, sequential, recognized, organizational patterns of nonpsychotics (Beck, 1968; Klopfer, 1956; Rickers-Ovsienkina, 1938; Rorschach, 1942).

The presence of confabulated or autistic responses on the Rorschach reflect the deviant, illogical thinking patterns of the schizophrenic. Such responses represent the seemingly arbitrary combination of contiguous percepts into a relationship having idiosyncratic meaning at the expense of consensual logic. Schizophrenics also show a low percentage of good form responses, which attests to reality-testing ability and degree of perceptual differentiation. Thought blocking, especially in the paranoid subject, and positional responses on the Rorschach are other diagnostic signs (Beck, 1968; Klopfer, 1956; Rickers-Ovsienkina, 1938; Rorschach, 1942).

Cognitive symptoms on the TAT, which is most suitable for detecting incipient schizophrenic disturbances, include overelaborate symbolism dealing with the meaning of life and death; overly abstracted religious themes; delusion like content, often in the form of themes of magical influence or unnatural power; disjointedness in the communication of meaning and/or affect; arbitrary or irrelevant story content in relation to the pictured stimulus; and, peculiar verbalizations, cryptic explanations, vague generalizations, nonsequitors, autistic logic, and omission of ideas necessary for story coherence and continuity (Schafer, 1948).

The language and thinking of schizophrenics have either been depicted as representing a deficit (in conceptual thinking, for example) or a type of disturbance (as overinclusion, paleologic thinking) (Forrest, et al., 1976). Bleuler (1950) seems to consider the defect in thinking as the primary defect in schizophrenics. He postulated that a weakness in association exists, a consequence of which is that fears and wishes rather than logical connections control the trend of thought.

Lang & Buss (1965), in an extensive review of the literature on the psychological deficits in schizophrenia, concluded that the evidence supports deficits in the higher organizational processes, the salient characteristics of which are difficulty in focusing on relevant stimuli, maintaining adequate attention, shifting sets when necessary, excluding irrelevant stimuli, and a general lack of efficiency in performing.

Generally, the schizophrenic is expected to manifest impaired mental efficiency. His thinking process will be slow and show difficulty in shifting. Perceptually, he has difficulty attending to relevant details (as shown on picture-completion tests), although the latter may not be true of the overvigilant paranoid (Rosenbaum, 1970). WAIS findings show a somewhat lower general level of intelligence in schizophrenic subjects. It is not known, however, whether this finding is true of all schizophrenic groups or only for the more chronic samples, for example (Rosenbaum, 1970).

Deficits in reality testing ordinarily manifest themselves on performance items. The Block Designs subtest reflects this deficit when the individual reproduces a design with distortions and believes it is correct. Organic subjects may make the same mistake, but will not think it correct. They will just be unable to correct it (Rosenbaum, 1970).

As has been stated earlier, the schizophrenic has difficulties in excluding irrelevant stimuli, attending to relevant details, and in shifting sets when necessary. Four psychodiagnostic indices that reflect failure to establish focus on appropriate stimuli are: unusual location choice; figure-ground blurring (both on the Rorschach); picture completion deficiency on the WAIS; and perseveration on the Rorschach or WAIS. Schizophrenics are often unduly sensitive to the usually overlooked details of daily life and relatively unresponsive to obvious stimuli commonly attended to by normal persons (Weiner, 1966).

Weckowicz (1960), using an embedded-figure task, found that the 99 schizophrenics in his study performed significantly poorer in discriminating the embedded figures than his 62 normal and patient controls. Another sign of the schizophrenic impairment of cognitive focusing are "Whole" responses on the Rorschach which represent failure to differentiate space from the gray or colored aspects of the blots (Weiner, 1966).

The picture completion subtest on the WAIS measures the ability to differentiate the essential from the nonessential elements of a situation. Deficient picture-completion performance is defined by a discrepancy between picture completion attainment and general intellectual capacity as indicated by the WAIS vocabulary score. Weschler (1958) states that schizophrenics tend to perform poorly on the picture completion subtest because they are "Oblivious to details" (Weschler, 1958).

Perseveration refers to the inappropriate persistence and repetition of ideas in responses. On the Rorschach a score is classified as perseverative when a response is given three or more times without regard for the formal blot (Becker, 1956).

One of the major manifestations of the cognitive deficit in schizophrenia is termed thought disorder. Thought disorder has been explained in relation to a number of factors. Bannister (1962), Bannister & Fransella (1966), and Bannister & Salmon (1966) describe the thought-disordered schizophrenic as lacking in the notion of concept or "construct" (Bannister, 1962) necessary for predicting regularities in the events surrounding him. Experimenters have been able to differentiate the thought disordered schizophrenic from other pathological groups and normals by testing for two types of consistency: one of sorting concepts or constructs in such a way as to retain their interrelationship over two different sets of persons at the same testing time (for example, if kindness and honesty went together in one set, consistency would have them relate in the other also); and, in retaining the interrelationship for the same set of persons at different times. Bannister (1962) utilized this type of test by presenting a series of photographs of persons and requiring the patients to sort them in terms of constructs. Besides differentiating thought disordered schizophrenics from other pathological groups and normals, the test also differentiated thought-disordered schizophrenics from schizophrenics not so clinically characterized.

Bannister & Salmon (1966) have noted that schizophrenic thought disorder is more pronounced with respect to the judgment of persons than of objects. They suggest that the degree of difference within a patient might be used as an indicator of severity of the condition. Bannister (1962) has hypothesized that schizophrenic thought disorder is the end product of serial invalidation in which the patient has repeatedly predicted the behavior of other people incorrectly, and as a result, the patient falls back on amorphous conceptions of people which cannot be so easily mispredicted.

Cameron (1944) has interpreted the schizophrenic's thought disorder as representing a social deficit. Several researchers have sought to investigate this social-communicability deficit. In one experiment, schizophrenics were shown to differ from normals in social-communicability even on a sorting test designed to show abstraction deficit (McGaughran and Moran, 1956) but other researchers have failed to confirm this finding (Sturm, 1964). Whiteman (1954) administered a test in which schizophrenics were asked to perform concept tasks involving social, as contrasted with formal, nonsocial concepts. The schizophrenics showed a greater deficit for the social concepts, and the author concluded that social withdrawal is critical in the cognitive functioning of the schizophrenic.

In another experiment, Davis and Harrington (1957) included human abstract stimuli in a comparison of problem solving ability in schizophrenics and normals. The performance of the schizophrenics was significantly disrupted by the inclusion of human stimuli. This result led the authors to conclude that schizophrenics do not have a general intellectual deficit, but that the deficit is specific to human stimuli. Further evidence for such a special deficit in schizophrenia was furnished by Pishkin (1963).

The schizophrenic's exaggerated responsiveness to emotional stimuli also interferes with his cognitive functioning (De Wolfe, 1962). Deering

(1963) compared schizophrenics and normals on the number of different responses that emotional vs. neutral stimulus words evoked in a word association test. Schizophrenics were found to emit a larger number of different responses to the emotional words than did the normals but the same number of responses to neutral words.

Feinberg & Garman (1961) hypothesized that schizophrenics make more implausible or random errors than either normals or organic patients. In an investigation utilizing the Progressive Madness Test, results showed that the acute schizophrenic, but not the chronic schizophrenic, made a larger number of implausible errors than any other group.

Overinclusive thinking has been hypothesized as a central feature of schizophrenic thought (Cameron, 1938a, 1938b, 1939a). Overinclusive thinking is characterized by an inability to preserve conceptual boundaries, so that ideas which are only distantly related, or even irrelevant to a concept become incorporated into it, and are regarded as a necessary part of it (Cameron, 1938a, 1938b, 1939a). Payne (1966) states that overinclusion is a relatively rare disorder which is found in at most 50% of a typical sample of acutely ill mental patients. When it does occur, it is usually a relatively short-lived condition. Though it does not appear to respond to any known drug, in most cases it clears up within a month or two. Relapses may occur, however. When first experienced, it may be characterized as a feeling, difficult to verbalize. The patient may state that things look different and that sensations are more intense than normal. Delusions may gradually develop as a result of complex interactions between the resulting attention defect and errors of thought which tend to produce unjustified generalizations. Sometimes, delusions are reinforced by the patient's environment and/or doctors who may encourage the patient not only to talk about his false beliefs but to continue to hold them. In this way it is possible that in some patients delusions become functionally autonomous and persist long after the overinclusion that caused them has disappeared (Payne, 1966).

Payne, Friedlander, Laverty & Haden (1963) investigated overinclusive thinking and retardation of 40 long-term chronic schizophrenics. The authors concluded that overinclusive thinking does not seem to characterize chronic schizophrenics as a group, but that an extreme degree of retardation does. Babcock (1933, 1941) suggested that a main cause of schizophrenic thought disorder is an extreme degree of generalized motor and mental retardation. Schizophrenics take long to work out the answer to even a simple question that, in response to the social pressure of normal conversation to answer, they produce responses before they have had time to formulate an appropriate reply. Babcock in a number of large-scale studies has shown that schizophrenics are very slow at a wide range of tasks. Payne (1953) has also shown that thought disorder can be manipulated by manipulating the social pressure and the response time allowed.

Schizophrenics have been shown to make errors of overinclusion when asked to sort objects (pictures or words presented on cards) into specific categories. This tendency is also demonstrated when they are asked to underline all those words (out of a given group) which they believe to represent an essential part of a concept denoted by a stimulus word. The acquiring of an overinclusive definition of a concept is not thought to originate at the time the concept was initially learned, but probably develops much later, along with other schizophrenic symptoms (Payne, 1961). Payne (1968) has pointed out that tests used to investigate overinclusiveness are conceptually similar to those used to investigate distractibility.

Using a sorting task with a number of distractors which had to be ignored in order to get a correct sort, Chapman (1956) showed that the difference between chronic schizophrenics and normals increased as the number of distracting elements was increased. Downing, Ebert and Shabrooks (1963a, 1963b) and Downing, Shabrooks and Ebert (1966) have shown that distractors more strongly associated with the stimulus words result in a greater number of conceptual errors than do the more weakly associated distractors. They conclude that schizophrenics do not suffer from a loss in abstract attitude, but rather from a pathological distractibility. Payne (1968) is of the opinion that overinclusiveness characterizes the acute schizophrenic while distractibility seems to characterize the chronic schizophrenic.

There is some controversy concerning the schizophrenic's capacity to think abstractly. As a group, schizophrenics produce the greatest variation in scatter of scores and response variability over subtests of any group tested on the WAIS (Rabin, 1965; Wechsler, 1944). Generally schizophrenics have lower overall performance subtest scores than verbal subtest scores. However, variability of scores between the 2 subtests is conspicuous and is partly correlated with severity. Diagnosis by test signs are unreliable due to the schizophrenics marked variability in intellectual performance. Rappaport (1945) has considered marked differences between a low abstract ability score and a high vocabulary information score as the only pathognomonic sign for schizophrenia on the WAIS. It has been suggested that this finding relates to the loss of abstract ability in the schizophrenic. There is doubt, however, that this loss of abstract attitude is a consistently important phenomenon in schizophrenia (Maher, 1966).

Freeman, Cameron and McGhie (1958) demonstrate that disturbances in both thinking and the familiar primary process mechanisms of displacement and condensation arise out of the schizophrenic's inability to distinguish between the self and non-self. Furthermore, they attribute disturbances in symbolic functioning, in synthetic thinking and the capacity to think abstractly to the same inability.

Carson (1962), in a study of the schizophrenic's avoidance of unambiguous statements produced evidence to contradict the abstract deficit in schizophrenia. He constructed a multiple-choice proverbs test in which alternatives were another proverb having the same meaning, an abstract interpretation of the proverb, a literal interpretation of the proverb and an irrelevant proverb. Schizophrenics chose the unambiguous abstract interpretation significantly less frequently than did a group of psychiatric non-schizophrenic patients. They did not, however, choose the literal alternative more frequently nor did they choose the other ambiguous abstract alternative less frequently than other patients. As the literal interpretation was not preferred these results were interpreted as contradicting the presence of an abstract deficit in schizophrenics.

Goldstein (1939, 1943) regards the schizophrenic process as an expression of "the concrete attitude." To Arieti (1966), however, schizophrenic cognition seems to result not from a reduction to a concrete level but from a process of active concretization. The term means that the psyche is still to a certain degree capable of conceiving the abstract, but is not able to sustain it, because it is too anxiety-provoking or too disintegrating. In the process, the patient who has a feeling that the whole world is hostile and rejecting transforms such concepts into the idea that "someone" or "they" are against him. It might be said that the higher level (abstract concepts) impinges itself upon a lower form. In schizophrenia, the abstract level disappears within the concrete form and the patient is no longer aware of it (Arieti, 1966, 1955). Active concretization is characterized by disturbances such as adualism, paleologic or predicative thinking, and awholism.

Baldwin (1932) defines adualism as the lack of dualism; the inability, often found in young children, to distinguish between the world of mind and the external world. If conceived potentialities and assumptions are too anxiety-provoking or if they have something to do with his complexes, the schizophrenic will not be able to sustain them. They are translated into real facts. "Something which is known" becomes equivalent to "something which exists" (Arieti, 1966).

One of the most important disturbances in logic in the schizophrenic is predicative or "Paleological" (Arieti, 1955) thinking. In this type of thinking, which follows the primary process, things are made identical because they share a common characteristic. The term, "Paleological" refers to the fact that such thinking is found in the very young who are just learning to reason. In predicative thinking, words may also lose their connotation power. What instead acquires prominence is the verbalization itself--the word becomes predominantly a phonetic entity and not a carrier of meaning (Rosenbaum, 1970).

Awholism refers to the fragmentation of what is normally a whole perception. A part will assume supremacy over the whole. At times, however, a part may stand for the whole to which it belongs or for any other part of the whole. Sometimes the part remains a part with little or no further organization. This perceptual and apperceptual fragmentation may result in the patient talking in a "word salad" (Payne, 1966).

The phenomenon occurs frequently in the most severe or acute forms of schizophrenia, but appears to a milder degree in chronic cases. The very regressed or very acutely ill patient is unable to perceive or conceive what to the normal person appears as wholes or segregated units. Pronounced fragmentation of the whole takes place in states of acute confusion, of which the patient usually retains only a vague memory. Due to this difficulty that patients have in remembering it, the phenomenon has not been adequately described. The fact that disintegrated wholes have no names or cannot be classified according to the conceptual artifacts of previous experiences is a probable explanation for the amnesias (Payne, 1966). Arieti (1955, 1959) sees the cognitive alterations of the schizophrenic as expressions of a "progressive teleological regression actualized by various forms of concretization." In regression the content of symptoms may reproduce earlier experiences. The forms that these symptoms assume may be the ones generally used in lower forms of cognition or even those which once appeared at earlier phylogenetic levels. In the schizophrenic's psychological structure an attempt is made to "fit a higher content into a lower form" (Arieti, 1966). Teleological implies that the logic serves to avoid anxiety and to reestablish psychic equilibrium. Schizophrenic regression is classified as progressive in nature because, even though it is to some extent purposeful, it is very rarely successful and therefore, tends to repeat itself. The schizophrenic may regress to, but not integrate at, a lower level, thus remaining disorganized. In order to defend himself from this disorganization, the patient may regress to an even lower level. The process may repeat itself until complete "dilapidation" occurs (Arieti, 1955).

The similarity between children's and schizophrenics' perceptions has been investigated by several researchers, though none claim that thought content in young children and psychotics is alike; it is more in their manner of approach to perceptual stimuli that the two groups show similar behavior (Phillips and Framp, 1954 in Meredity). Friedman (1953) using the Rorschach, showed that schizophrenics respond perceptually in some respects in a manner similar to children. Feifel (1949 in Merredith) showed that children and schizophrenics define words in a similar manner, and Ellsworth (1951) found that children and schizophrenics were similar in the way they used different parts of speech. In a 1953 study, Friedman obtained results suggesting that the perceptual functioning of schizophrenics, in its structural aspects, is related to that of the child. Similar characteristics include primitive globability, syncretism, lability, diffuseness, and rigidity. Friedman also states that schizophrenics suffer considerable impairment in their capacity for differentiation and heirarchic integration. Unlike children, however, certain aspects of higher level functioning can be identified.

There is evidence that thinking involving visual symbols is also disturbed in schizophrenia (Weckowicz, 1957; Johannsen, et al., 1964). Harris (1957) found that a group of schizophrenics did not differ from normals on a size-estimation task. However, when they were subdivided on the basis of premorbid adjustment, significant differences were found. Good premorbid schizophrenics underestimated stimulus size and poor premorbids overestimated stimulus size (Kopfstein & Neale, 1973). Silverman (1964) found underinclusive performance in chronic and paranoid schizophrenics and size overestimation was found in a group of chronic schizophrenics with current paranoid symptoms.

The Wechsler Memory Scale was administered by Cohen (1950) to psychoneurotics, organics and schizophrenics. No significant differences in memory were found between the groups. Rabin & Geiser (1949) have shown that there are no significant differences between schizophrenics and nonpsychotics with respect to achievement levels in basic school subjects. All were uniformly poor in arithmetic when compared with other school subjects.

Overall intellectual impairment in schizophrenia has been demonstrated in a number of studies but the conclusion must be qualified: The impairment is not demonstrated in all schizophrenic groups. For example, it is not noted in the catatonic and paranoid types. This impairment is not considered a real deficit, but is largely dependent on such non-intellectual factors as motivation, attention, and social response, etc. Evidence for typical differential intellectual loss and a unique or characteristic intellectual structure in schizophrenia is inconclusive (Rabin & King, 1958).

Lane & Albee (1963) studied performance on group and individual intelligence tests of adult schizophrenics when they were in public school in the Cleveland area. They found that the children who subsequently became adult schizophrenics demonstrated a conspicuous and significant average decline of more than 10 IQ points between early childhood and late childhood. A control group of more than 800 children who had taken the same 2 group tests in the 2nd and 6th grades showed a slight increase in IQ over this time, but they were generally from higher socioeconomic groups than the pre-schizophrenic subjects.

In a later study, Lane & Albee (1964) showed that children who later became adult schizophrenics scored significantly below the average of other children in their school classes (2nd, 6th, & 8th grades). They were much more frequently in the lowest quarter of their class and much less frequently in the higher quarter of their class than could be expected by chance. The authors concluded that inferior intellectual performance throughout childhood is characteristic of future schizophrenics even when socioeconomic factors are controlled.

Pre-schizophrenics have also been shown to score consistently lower than their siblings on IQ tests. Lane & Albee (1965) compared IQ test performance of pre-schizophrenics with that of their siblings, who had taken the same tests during the same grades at school at approximately the same ages. Comparison of IQ's obtained on group intelligence tests in 2nd, 6th, and 8th grades showed that future schizophrenics performed significantly lower than their own siblings on the IQ tests throughout childhood. They were, much more frequently than could be expected by chance, the lowest scoring child of the family. Future schizophrenics, whose IQ's were below average, came from families of average intelligence. There is some evidence from Batman, Albee & Lane (1966) however, that suggests that these lowered IQ scores are the result of reduced or distorted motivation rather than a true intellectual deficit.

Albee, Lane, Corcoran & Wernecke (1963) found that IQ scores on the Wechsler-Bellevue tests administered to subjects while psychotic remained at approximately the same level as the earlier IQ scores of the same people on group tests administered during the 2nd and 6th grades. In another study, Batman, Albee & Lane (1966) investigated what happened to IQ scores of schizophrenics for whom they already had childhood and admission tests, 10 or more years after the first hospital tests. Subjects were separated into those "still hospitalized" and those "living at home." A comparison of contemporary scores with hospital admission scores showed that no deterioration was present in the "still hospitalized" group, but the "living at home" group showed a significant increase in scores.

Essentially the same results were obtained when the group was divided into those judged "still schizophrenic" and those judged "no longer schizophrenic." Subjects who were considered as recovered scored significantly above their hospital admission tests as well as significantly higher than their own childhood tests. The average scores of those judged "still schizophrenic" did not differ from their admission scores or from their childhood scores. The evidence is strong that schizophrenia is not accompanied by progressive deterioration of measured intelligence. The authors also suggest that the relatively poor performances during childhood and adulthood do not necessarily reflect basic capacity. Performance has been shown to improve significantly with improved circumstances and adjustment later in life (Batman, Albee & Lane, 1966).

## TABLE 3-7

## LIFE FUNCTION TABLE - SCHIZOPHRENIA: COGNITIVE INTELLECTUAL

| Statement of Problem | Dynamics | Source |
|---|---|---|
| Words may lose their connotation power | Characteristic of Paleologic thought | Arieti (1966) |
| Inability to sustain conceptualization of abstract | Abstract level disintegrates into concrete form (Active Concretization) | " |
| Inferior intellectual performance | Pre-schizophrenics | Albee, Lane, & Reuter, 1964; Lane & Albee, 1965 |
| Limited recall | Is related to a greater tendency to respond to temporally and spatially immediate stimuli than to remote | Salzinger, 1971a, b<br>Carson, 1958; Gladis, 1967; Machmani & Cohen, 1969 |
| Disturbances in symbolic functioning | Some authors attribute these disturbances to an inability to distinguish between self- and non-self. | Freeman, Cameron & McGhie, 1958 |
| Disturbances in synthetic thinking | " | " |
| Disturbances in capacity to think abstractly | " | " |
| Overinclusive Thinking | Relatively rare-occurring in not more than 50%. | Payne, 1961 |
| Thought blocking | Paranoid | Rosenbaum, 1970 |
| Presence of confabulated or autistic responses | Arbitrary combination of contigous percepts into a relationship having idosyncratic meaning | " |
| Overinclusiveness in thinking | Especially in acute schizophrenia | Payne, 1968 |
| Distractibility | Especially in chronic schizophrenia | Payne, 1968 |
| Pathological Distractibility | Explains cognitive deficit | Downing, Ebert & Shabrooks, 1963a;<br>Downing, Shabrooks & Ebert, 1966 |

TABLE 3-7 cont'd.

| Statement of Problem | Dynamics | Source |
|---|---|---|
| Awholism | Patient responds to only a part of what is normally a whole perception or conception. Frequent in most severe and acute forms of schizophrenia. Occurs to a milder degree in Chronic patients. | Arieti, 1966 |
| Pronounced fragmentation | Very regressed or very acutely ill patient. Takes place in states of acute confusion | " |
| Amnesia | Results from experiences and perceptions occuring from fragmentation (awholism) | " |
| Slowed thinking | All types | Rosenbaum, 1970 |
| Intellectual impairment | Not noted in catatonic or paranoid types | Arieti, 1966 |
| Adoption of new cognitive mechanisms | Constant feature in all schizoprenia syndromes | " |
| Difficulty in establishing cognitive focus | Attributed to deficits in higher organizational processes | Lang & Buss, 1965 |
| Difficulty in maintaining adequate attention | " | " |
| Difficulty in shifting sets | " | " |
| Difficulties in differentiating essential from non-essential elements | Oblivious to details. Evidenced by poor performance on picture completion subtest on WAIS. | Weschsler, 1958; Rogers, 1951 |
| Easily distracted | Difficulty in selecting the most relevant aspects of a stimulus field and adjusting attention to accord with changes | Lang & Buss, 1965; McGhie & Chapman, 1961; Chapman & McGhie, 1962 |
| Sensitivity to the commonly overlooked detailes of daily life | Evidenced on Rorschach | Beck, 1968 |
| Perseveration | Indicated by scores on Rorschach | Becker, 1956; Pittrowski, 1936, 1937, 1940 |
| Lowered over-all performance scores | WAIS-Variability of subtest scores is partially correlated with severity | Rosenbaum, 1970 |

TABLE 3-7 cont'd.

| Statement of Problem | Dynamics | Source |
|---|---|---|
| Deficits in reality testing | Manifested on WAIS performance items | Rosenbaum, 1970 |
| Difficulty in attending to relevant details | As in picture-completion subtest--may not be true for overvigilant paranoids. | Rosenbaum, 1970 |
| Avoidance of unamibiguous statements | As shown on multiple-choice proverbs test | Carlson, 1962 |
| Higher frequency of implausible or random errors | Especially acute schizophrenia | Feinberg & Garman, 1961 |
| Lower general level of intelligence | Is unknown whether this is true for all schizophrenic groups or only for the more chronic samples | Arieti, 1955 |
| Predicative thinking | Is one of the most important disturbances in logic in schizophrenics. Is also termed "Paleological" because such thinking is found among the very young who are just beginning to learn to reason | Arieti, 1955 |
| "Teleological Regression" | Logic serves to avoid anxiety, is emotionally determined and becomes increasingly primitive | " |
| Impaired processes of formal logic | Frequently found | " |
| Schizophrenic thought disorder | Is more pronounced with respect to judgment of persons than objects. The degree of difference might possibly be used as a sign of severity. | Bannister, 1962; Bannister & Fransella, 1966; Bannister & Salmon, 1966. |
| Positional Responses | Responses not determined by percept, but by position (in blot on Rorschach) Relatively Rare | Arieti, 1955 |
| Loss of abstract function | Related to degree of ego organization | Forrest, Hay, & Kushner, 1971 |
| Weakness in Association | Fears and wishes rather than logical connections control the trend of thought | Bleuler, 1950 |

| Statement of Problem | Dynamics | Source |
|---|---|---|
| Distortion of body image | Cognitive symptoms of schizophrenia | |
| Disturbances of language | " | " |
| Retreat from reality to fantasy, hallucinations, delusions | " | " |
| Impaired mental efficiency | Particularly where effort is required | Arieti, 1955 |
| Adualism | Emotionally laden thoughts become reality, actual things, or events | |
| Schizophrenic thought disorder | Is possibly caused by an extreme degree of generalized motor and mental retardation | Babcock, 1933, 1941 |
| Overall intellectual impairment | Not demonstrated in all schizophrenic subgroups (not noted in catatonic and paranoid). Is apparently not a real deficit, but largely due to non-intellectual factors such as motivation, attention, etc. There is strong evidence that schizophrenia is not necessarily accompanied by progressive deterioration of measured intelligence | Mason, 1956 |
| Differential impairment of intellectual functioning | Catatonic paranoids score close to average intelligence levels; simple, hebephrenic and mixed lower. | Mason, 1956 |
| Deviation from normal adult definitions | Children and schizophrenics have been shown to define words in a similar manner | Feifel, 1949 |
| Equation of antonyms with synonyms | Children and schizophrenics may tend to do this to a greater extent than normals | Burlstein, 1959, 1961 |
| Impairment in capacity for differentiation and heirarchic integration | Perceptual functioning in its structural aspects, is related to that of children. | Friedman, 1952 |

Social-Attitudinal. One of the major manifestations of schizophrenia is interpersonal or social withdrawal. Symptoms of social withdrawal are fear of others, avoidance of relationships with others, and isolation from others (Buss & Buss, 1969). Grinker and Holtzman (1973), using the Schizophrenia State Inventory (SSI) identified five qualities that distinguish the young schizophrenic from the non-schizophrenic. They are: the presence of disordered thinking, a diminished capacity to experience pleasure, particularly in interpersonal relationships, a strong tendency to be dependent on others, and a very vulnerable sense of self-regard. Anxiety was not found to be a differentiating characteristic.

Schizophrenia items on the Schizophrenic Scale of the MMPI are composed of questions reflecting the presence of unusual or bizarre thoughts, feelings and experiences, and questions reflecting social isolation and/or alienation. WAIS findings show that schizophrenic subjects may manifest highly blase or apathetic attitudes. They may behave evasively in a passive manner (extreme slowness) or aggressively in either negativistic or impulsive, reckless styles (Rosenbaum, 1970).

Schizophrenia is often associated with the acting out of certain behaviors, particularly the more bizarre types. Such behavior is connected with the special cognitive processes such as active concretization, delusional thinking, and hallucinations. The schizophrenic, though he may still be capable of conceiving abstract ideation, is unable to sustain it. The abstract is immediately transformed into concrete representations of activities (Arieti, 1974).

Some patients, in the latter stages of intensive therapy will demonstrate what has been called "pseudo-psychopathic" activity. The patient may become tactless and aggressive even though he has lost the typical schizophrenic symptoms. Such behavior is only temporary and will disappear if therapy is continued (Arieti, 1974).

Other acting out behaviors are those with obvious sexual content. Some chronic patients, at the onset of their illness, give vent to unrestrained sexual urges. Such behaviors are termed disinhibited as the patient is unable to inhibit his actions. In the past, sexual activity and the accompanying acting out behaviors were relatively rare among schizophrenics, but they have now become a common occurrence in both hospitalized and non-hospitalized patients (Arieti, 1974).

Rape occurs only rarely, but promiscuity is relatively frequent in both sexes. Obvious seduction on the part of female patients is very common. Homicide is not as common among schizophrenics as some people believe and newspapers intimate (Guttmacher, 1960).

Self-mutilation, or the socially unacceptable alteration of the body is found in many schizophrenics. Phillips and Alkan (1961) found this practice in 42.9% of a hospital population. The ratio of self-mutilation in men to that in women was slightly under 1 to 3 (Arieti, 1974). Though statistics on suicide among schizophrenics are generally unreliable due to the existence of many complicating factors, there seems to be no doubt that the incidence of suicide is considerably higher than the incidence in the general population (Lewis, 1933; Jamieson, 1936; Norris, 1959).

The dynamics of Freud's theory dealing with the relationship between the paranoid schizophrenic and homosexuality have been tested by means of the Rorschach and other projective techniques. Several studies, using Rorschach indices of homosexuality, have indicated that a relationship between paranoia and homosexuality does exist. On this test, paranoid schizophrenics have manifested a significantly greater incidence of these signs when compared with other non-paranoid psychotics and non-psychotics (Aronson, 1952; Chapman & Reese, 1953 cited by Aronson, 1952). Other studies comparing the same groups have been unable to find statistically significant differences concerning the relationship between paranoia and homosexuality. On the other hand, the findings of Chapman & Reese (1953) point to homosexual signs in all early schizophrenics.

As projected in the Blacky test, paranoid patients have shown more disturbances in the following psychosexual dimensions: Oral Eroticism and Sadism, Masturbation, Guilt, Anal Retentiveness, Internalized Guilt Feelings, Castration Anxiety, Identification Process, and Narcissistic and Analytic Love Object. However, when paranoids were compared with other psychotics, the paranoids showed greater disturbance only on Anal Retentiveness and Internalized Guilt Feelings (Aronson, 1953).

A major difficulty noted in the developmental histories of schizophrenics is their inability to relate effectively with the opposite sex (Weinberg, 1958). The schizophrenic's social relationships tend to be fragmentary and unsatisfying due to a confusion of sexual identity (Center for Studies of Schizophrenia, 1972).

Hamilton and Wall (1948) found that female adolescent schizophrenics were unable to manage the realities of interpersonal relations, especially with the opposite sex. They may seek the protective companionship of older men whom they idealize and upon whom they become very dependent. Some schizophrenics resolve conflicts in sexual identity by denying and repressing their sexual pursuits or refraining from associating with the opposite sex (Center for Studies of Schizophrenia, 1972).

The schizophrenic's confused sexual identity or sexual preoccupation are manifested on projective tests such as the Draw-a-Person and the

Rorschach. Drawings may portray figures with mixed sexual characteristics, overelaboration of genitalia, or figures in seductive positions. Schizophrenics also show a frequent increase in sexual responses on the Rorschach (Rosenbaum, 1970). In a study of more than 1,000 subjects of mixed diagnoses, Orme (1962) found that there were twice as many sex responses in the records of schizophrenics.

Withdrawal of sexual interest, concomitant with the generalized withdrawal of the schizophrenic, is more common. Sexually withdrawn schizophrenics may produce bare outline drawings in which figures are both neuter and lifeless on the Draw-a-Picture Test (Rosenbaum, 1970). It should be noted, however, that some investigators are of the opinion that there exists little supporting evidence for any of the assumptions made concerning the Draw-a-Picture Test and the interpretive significance of drawn figures (Swenson, 1966).

An important indicator of the schizophrenic's difficulties in establishing and maintaining relations with the opposite sex is the proportion of schizophrenics who are single. Faris and Dunham (1939) in a study of 10,575 hospitalized schizophrenics, found that 50.1 percent were single and only 19.7 percent were married. Of the 5,140 female patients in the study, 33.7 percent were single and 43.2 percent were married. Of the subtypes of schizophrenics, female paranoids had the lowest percentage of married persons. The significance of these percentages becomes apparent when compared to the 80 percent (approximately) figure representing the percentage of people in the United States between the ages of twenty-five and thirty-four who were married at the time of the study. In a 1936 study, Malzberg found that when standardized for age, the rate of first admissions to state mental hospitals in New York was 5.4 times greater for single than for married males.

Incidence rates for all types of psychoses have been found to be highest in the widowed, divorced, and separated categories, the next highest rates are in the single group, and the lowest among the married (Dunham, 1966). In a sample of 295 schizophrenic patients, single men were more than two times overrepresented, and previously married males were more than three times overrepresented. Single patients on the average, spend more than two times longer in the hospital than do the married or previously married. Table 3-8 shows the number and percentage of schizophrenics in a representative sample and of the Detroit general population by marital status.

Case histories of pre-schizophrenics have pointed to certain abnormalities in family relations. Waring and Ricks (1965) found that chronic schizophrenics frequently come from symbiotic parent-child relationships. Consistent instability has been found to characterize the parents of schizophrenics, especially the mothers, although expressions of such instability vary (Friedlander, 1945; Whitman and Huffman, 1944). Lidz & Lidz (1949) found that mothers of schizophrenics were domineering, aggressive, hostile, or overprotective and indulgent. Several studies have found that while fathers appeared normal, their outward appearance was often deceptive. They found that fathers may influence their children by disorganizing them with their competitive, inconsistent or demanding relationships. In some cases, children were not defended when abused by mothers, indirectly sanctioning the abusive reactions to the children.

The basic familial effects upon the schizophrenics during childhood and adolescence are to suppress their capacity to assert themselves and

## TABLE 3-8

## NUMBER AND PERCENTAGE OF SCHIZOPHRENICS IN SAMPLE AND OF THE DETROIT GENERAL POPULATION BY MARITAL STATUS

| | Sample | | General Population | |
|---|---|---|---|---|
| | Number | Percent | Number | Percent |
| Single | 96 | 42.3 | 483,095 | 21.4 |
| Married[2] | 73[1] | 32.2 | 1,515,060 | 67.1 |
| Divorced | 32 | 14.1 | 67,195 | 3.0 |
| Separated | 18 | 7.9 | 47,540 | 2.1 |
| Widowed | 8 | 3.5 | 145,270 | 6.4 |
| | 227 | 100.0 | 2,258,160[3] | 100.0 |

[1] Includes four common-law.

[2] Does not include "separated."

[3] General population data from Table 57, U.S. Census Reports for 1950--Fourteen years old and over--Detroit Standard Metropolitan Area.

Source: Hollingshead (1958), p. 297.

their needs. Instead they are encouraged to direct their behavior towards satisfying parental needs, to inhibit aggression, and to become dependent and yet hostile and competitive. These patterns seriously hinder the capacity for relating effectively with others, especially with persons of their own age (Rosenbaum, 1970).

That the schizophrenic family often cultivates a basic lack of self-worth is sometimes manifested by definite trends towards withdrawal, but in other cases intense, overcompensatory drives for self-improvement can be seen in the case history (Rosenbaum, 1970). Lu (1961, 1962) studied parents of schizophrenics and their offspring and found that the preschizophrenic, in contrast to his siblings, was highly restricted in meaningful contacts outside the family.

Lidz, et al. (1965) in a study of several upper middle class families, pointed out that the role relationship between parents of schizophrenic children are often distorted. The families demonstrated family-wide deficits in perceiving social reality. None of the marriages seemed normal and were marked by what the authors termed *marital schism* or *marital skew*.

*Marital schism* is characterized by the spouses' self-preoccupation. There is a sense of desperation, lack of mutual support, inability to deal with marital problems, mistrust bordering on the paranoid, and devaluation of the worth of one or both partners in the childrens' eyes. Fathers may be narcissistic, grandiose, and denying of incestuous preoccupations with the daughters (Lidz, et al., 1965).

*Marital skew* occurs when serious psychopathology of one partner dominates the home. This psychopathology was usually masked and treated as normal. Fathers were found to be generally weak and ineffectual, going along with the delusions of a disturbed wife, or outwardly strong because of the wife's masochistic support. Distorted ideas of one partner were often shared by the other ( Lidz, et al., 1965).

The families of female schizophrenic patients tended to be highly schismatic. The mothers were insecure and unhappy, and their efforts to be attentive and maternal toward their daughters were thwarted by their own emotional problems. There was poor mother-daughter identification. Many of the fathers were highly narcissistic. Others were grandiose or overtly paranoid. The daughters experienced a role conflict caused by the fathers' combination of seductiveness and paranoid denial of incestuous interest. Resolution of the conflict is impossible without rejection of one parent or the other (Lidz, et al., 1965).

The familes of male schizophrenics tended to more skewed, with domineering mothers who maintained a symbiotic and erotic relationship with their sons. The fathers were described as passive, psychotic, alcoholic or distant, and provided poor masculine roles models for their sons (Lidz, et al., 1965).

The effects of these abnormal familial relations are related to the schizophrenic's withdrawal and lack of relationship with his peers later in life. Weinberg (1950) found that though some schizophrenics had friends and companions, many lacked the sociability for relating with their age-mates. They seemed to operate on the fringe of their peer-groups or appeared to be isolated from them. Clausen and Kohn (1955) found that 34 percent of forty-five schizophrenic subjects were either solitary or only played occasionally with friends. By contrast, only 4 percent of 45 normal controls were comparably isolated from their associates. Eighty percent of the controls had close friends or a crowd, but only 45 percent of the schizophrenics had correspondingly close associates (Weinburg, 1960).

The schizophrenic's functioning as a family member is characterized by "pseudomutuality." There is no more than a highly superficial concern for the other members' well-being, though there may be an outward appearance of mutuality. Brody (1959) found there often exists a stereotyped and rigid role structure operating within the family with a schizophrenic member. Schizophrenic parents may hold a particularly rigid set of role expectations for each member of the family; a set of ideas that does not allow for normal maturation, growth, and life changes in any of the members. In more extreme cases, they may refuse anyone in the family to establish a clear role for himself that includes a natural combination of his own abilities, talents, needs and interests (Wynne, et al., 1958).

Married schizophrenic's have been shown to produce more children per marriage than the national average, but results vary from study to study (Goldfarb & Erlenmeyer-Kimling, 1962).

Schizophrenics often express unrealistic vocational aspirations. Judged by both the expressed interests and interest inventories, they appear interested in areas and occupations which do not appear to be appropriate in terms of aptitudes and personality. An apparently disproportionate number of schizophrenics seem to want to become social workers, psychologists, psychiatrists, counselors of similar professional practitioners (Patterson, 1957). Forer (1953) has stated "In general it seems likely that the amount of discrepancy between vocational aspiration and vocational aptitude, in either direction is a measure of the degree of personality disintegration."

## TABLE 3-9

## LIFE FUNCTION TABLE - SCHIZOPHRENIA: SOCIAL ATTITUDINAL

| Statement of Problem | Dynamics | Source |
|---|---|---|
| Social isolation and/or alienation; lack of close friends. | Manifested on MMPI Schizophrenia Scale | Schneidman, 1948;<br>Rosenbaum, 1970 |
| Interpersonal withdrawl | Manifested on the Rorschach in not seeing people | Rosenbaum, 1970 |
| Presence of unusual or bizarre thoughts, feelings, experiences | Manifested on MMPI Schizophrenia Scale | Schneidman, 1948;<br>Rosenbaum, 1970 |
| Difficulties in empathizing with others | Lacking in schizophrenic or overly employed in hyper-vigilant paranoid | Beck, 1968; Klopfer, 1956;<br>Rickers-Ovsienkina, 1938;<br>Rorschach, 1942 |
| Extremely self-interested | Manifested on MAP Story Test | Schneidman, 1948 |
| Unrealistic anxious, fearful attitudes | Manifested on MAP Story Test | Schneidman, 1948 |
| Unrealistic vocational aspirations | Appear interested in areas and occupations which do not seem to be appropriate in terms of aptitudes and personality | Forer, 1953 |
| Inability to relate effectively with the opposite sex | Noted in the developmental histories of schizophrenics | Weinberg, 1958 |
| Inability to manage realities of interpersonal relations | Incipient stages | Hamilton & Wall, 1948 |
| Symbiotic parent-child relationships | Pre-chronic schizophrenics | Waring & Rick, 1965 |
| Stigmatization, feelings of shame & discrimination | After discharge from hospital | Cumming & Cumming, 1957 |
| Suicide | Third ranking cause of death among schizophrenics. Is 28 times higher in institutions than in the general population | Warner, 1937 |
| Self-Mutilation | Higher incidence among women patients | Phillips & Alkan, 1961 |

TABLE 3-9 cont'd.

| Statement of Problem | Dynamics | Source |
|---|---|---|
| Pseudopsycopathic Activity:<br>1) tactlessness<br>2) aggressive behavior | Occurs in some patients who are in advanced stages of intensive therapy and have lost the typical schizophrenic symptoms--Is temporary and usually disappears if therapy is continued | Arieti, 1974 |
| Highly blase or apathetic attitudes | Manifested on WAIS & Bender | Rosenbaum, 1970 |
| May behave evasively in a:<br>a) passive manner (with extreme slowness) or<br>b) aggressively in either negativistic or impulsive reckless style | Manifested on WAIS | Rosenbaum, 1970 |
| Confused sexual identity | Manifested on Draw-a-Picture Test | Rosenbaum, 1970 |
| Withdrawal of sexual interest | Is concomitant with generalized social withdrawal | Rosenbaum, 1970 |
| Generalized social withdrawal | Symptoms are fear of others, avoidance of relationship with others, isolation from others. | Buss & Buss, 1969 |
| Diminished capacity to experience pleasure, particularly in interpersonal relationships | Can be identified in the young schizophrenic | Grinker & Holtzman, 1973 |
| Stronger tendency to be dependent on others | Can be identified in the young schizophrenic | Grinker & Holtzman, 1973 |
| Vulnerable sense of self-regard | Can be identified in the yound schizophrenic | Grinker & Holtzman, 1973 |
| Acting out of unrestrained sexual urges | Onset of chronic schizophrenia. In the past was relatively rare, nowadays is common both in hospitalized and non-hospitalized patients | Arieti, 1974 |
| Promiscuity | Both sexes; but obvious seduction on the part of female patients is common | Arieti, 1974 |

TABLE 3-9 cont'd.

| Statement of Problem | Dynamics | Source |
|---|---|---|
| Active concretization, delusional thinking, halucinations | Acting out of bizarre behaviors | Arieti, 1974 |
| Feelings of abominable badness | Phase of Internal Disorganization may vacillate or become temporarily fixed | Kayton, 1975 |
| Feelings of grandiosity | Phase of Internal Disorganization may vacillate or become temporarily fixed | Kayton, 1975 |
| Feelings of total aloneness | Phase of Internal Disorganization may vacillate or become temporarily fixed | Kayton, 1975 |
| Feelings of persecution | Phase of Internal Disorganization may vacillate or become temporarily fixed | Kayton, 1975 |
| Profound passivity | Post-Psychotic Regression Phase | Kayton, 1975 |
| Depression | Post-Psychotic Regression Phase | Kayton, 1975 |

## VI. Functioning as a Member of Society

The literature provides information about the schizophrenic's functioning in the labor force and in the community.

## Functioning as a Member of the Labor Force

The Psychiatric Evaluation Project of the Veterans Administration conducted a study of vocational restoration using a sample of 3,609 schizophrenic patients under 60 years of age. Subjects were surveyed via a mail questionnaire as to the extent to which they had worked in the six months after their release from the hospital. Based on a 90 percent return rate, results indicated that two-thirds of the respondents reported themselves as not having worked as much as one month, and only 14 percent reported themselves as working as much as five or six months (reported by Weinberg, 1960).

Clark (1949) found that the rate of schizophrenia is highest among the unskilled occupations and declines with the rise in income and occupational prestige. Middle class schizophrenics have shown higher occupational aspirations than normal and neurotic subjects of the same class (Hollingshead & Redlich, 1953). Utilizing the Kuder Vocational Preference Record, Generelli and Butler (1955) reported the rank order for preference among fifty paranoid schizophrenics. From highest to lowest, the order was: Literary, Musical, Social Services, Artistic, Persuasive, Clerical, Scientific, Computational, and Mechanical.

In a 1969 follow-up study, the Institute Treatment Center (ITC), in affiliation with the Kentucky Department of Mental Health, found that the male schizophrenics in their sample had almost no occupational identity. Most of the men were not sufficiently identified with a work role to be tested, even as common laborers. Only a little over 25 percent of them had ever established an occupation. Between 23 and 39 percent of the males were welfare recipients, with most claiming compensation checks on the basis of mental disability. Between the years 1964-1969, only a few of the men had worked continuously, either part-time or full-time. Besides the 15-17 percent officially receiving mental disability compensation, an additional 13-22 percent were considered too sick to work by other members of their families. Eleven to 25 percent of the significant others stated that the patient had not been able to get hired. Fewer than 9 percent of the study sample were seeking employment at the time of follow-up. Between 16 and 26 percent of the three sample groups had lost jobs because of emotional episodes, interpersonal trouble with co-workers, or poor job performance related to their mental problems. With approximately one-half of the patients being the main financial support of their families, and depending as they did upon disability welfare assistance or upon common laboring skills, the average yearly household incomes were very low: under $3,500 for many patients and their families (Davis, et al., 1974). Tables 3-10 and 3-11 show the percent of women patients with homemaking duties and vocational performance of male patients at the time of the 1969 follow-up.

One major obstacle to the former mental patient's productive functioning as a member of the labor force has been the attitudes held by employers. There is some evidence, however, that the situation is improving. In a 1958 study of 200 employers (half of whom were manufacturers), Olansky, Grob and Malamud found that 75 percent of the respondents said they would hire a former mental patient as a matter of policy, but most had had limited experience with the mentally ill and seemed poorly informed. Interviews with industrial physicians and representatives of employment agencies and unions showed that these groups, too, had had little experience with former mental patients and only limited knowledge of mental illness. The authors hypothesized that discharged patients had most likely concealed their medical histories from prospective employers (Crocetti, et al., 1974).

## TABLE 3-10

## WOMEN PATIENTS WITH HOMEMAKING DUTIES AT ITC FOLLOW-UP (1969) *
(In Percent)

| Homemaking Activity | Drug Group N=35 | Placebo Group N=29 | Control Group N=34 |
|---|---|---|---|
| Primary working role is homemaking.............. | 44.4 | 51.2 | 42.2 |
| Disabled; incapable of homemaking**............ | 14.3 | 13.2 | 19.3 |
| Too mentally or physically ill to do housework...... | 9.3 | 11.4 | 18.5 |
| Primary homemaker in the household................ | 42.3 | 46.9 | 43.9 |

**Includes both physical and mental disabilities.

*Source: Davis, et al., 1974, p. 187

## TABLE 3-11

## VOCATIONAL PERFORMANCE OF MALE PATIENTS AT ITC FOLLOW-UP (1969)*
(In Percent)

| Vocational Item | Drug Group N=22 | Placebo Group N=11 | Control Group N=14 |
|---|---|---|---|
| Identifies with an occupation | 27.3 | 25.7 | 26.7 |
| Welfare recipient | 23.4 | 38.7 | 23.9 |
| Continuous employment in post-ITC period | 18.0 | 8.9 | 8.5 |
| Officially designated as disabled | 15.0 | 26.7 | 17.4 |
| Unable to get hired | 25.0 | 19.6 | 10.9 |
| Seeking work (1969) | 1.9 | 7.8 | 7.7 |
| Lost job because of mental problems | 16.7 | 15.8 | 25.9 |
| Patient is main breadwinner | 44.8 | 52.8 | 43.1 |
| Household income $3,500 or less | 37.8 | 43.9 | 44.3 |

*Source: Davis, et al., 1974, p. 68

Hoch and Zubin (1966) estimated that the cost of maintenance and loss of income attributable to schizophrenia comes to 660 million dollars per year.

## Functioning as a Member of the Community

Withdrawal from normal social functioning is a major characteristic of schizophrenia. Symptoms of social withdrawal are fear of others, avoidance of relationships with others, and isolation from others. In a 1950 study, Weinberg found that some of his schizophrenic subjects had friends and companions and were not lacking in the sociability for relating with their peers. Many, however, seemed to operate on the fringe of their peer groups or appeared to be isolated from them. In a study of forty-five schizophrenic subjects, Clausen and Kohn (1955) found that 34 percent were either solitary or only played occasionally with friends. In contrast, only four percent of the forty-five normal controls were comparably isolated from their peers. On the other extreme, 80 percent of the normal controls had "close friends" or a "crowd," but only 42 percent of the schizophrenics had correspondingly close associates.

In a 1962 study performed by the Institute Treatment Center in affiliation with the Kentucky Department of Mental Health, acutely psychotic patients were taken from two hospitals shortly after their admission and were, after screening, sent back to their families under the care of the experimental study staff. Five criteria were met by the patients: 1) a diagnosis of schizophrenia, 2) be neither suicidal or homicidal, 3) be between the ages of 18-60, 4) reside in the city of Louisville or an adjacent county, and 5) have a family that would accept the patient while providing supervision in the home. The patients were randomly assigned to three groups. The "home care drug group" (N=57) was comprised of those patients sent home on drugs under the care of the Institute Treatment Center (ITC) staff. The "home care placebo group" (N=41) were those individuals sent home on placebo medication. The third and control group was composed of patients who were returned to the hospital to undergo the usual course of hospital care (N=48). These patients were later referred (in 1964) to other facilities such as outpatient clinics of the state hospital system or local general hospitals (ITC Study reported in Davis, et al., 1974).

In a 1969 follow-up of these patients, the researchers found that the patients had had considerable difficulty with their social activities. Between 35 and 49 percent, depending on the group, had no close friends, a fact which was thought explainable by some of their unpleasant social habits. Thirty-three to 47 percent of the subjects could not meet people without acting strangely. Twenty percent had embarrassing or bizarre eating habits, while another 20 percent were messy and strange in their appearances. Poor judgment with money was fairly common, with 33 percent of the drug group being inadequate in money matters. Thirty-one percent of the placebo group and 29 percent of the controls had the same problem. Since the patients' habits were peculiar, they often refused to eat with the family or what the family members ate; consequently, they often ate alone.

The patients' social activities remained limited to passive entertainments, watching television, listening to the radio and sitting around with the family. They did not belong to organizations or to clubs. When they did go out, they went with family members to visit other members. Very few improved their social participation scores once the ITC terminated. Table 3-12 shows the mean percentage scores of the three groups on social activities at the time of follow-up.

The ITC study asked significant others in the patients' lives to report on the patients' relationships with the opposite sex. Behaviors

## TABLE 3-12

## SOCIAL ACTIVITIES OF PATIENTS AT FOLLOW-UP (1969)*

| Social Behavior | Drug Group N=57 | Placebo Group N=41 | Control Group N=48 |
|---|---|---|---|
| Has no "good" friends..... | 48.3 | 48.6 | 34.6 |
| Inappropriate upon meeting new persons........... | 32.8 | 47.0 | 38.7 |
| Inappropriate food and table habits........... | 16.7 | 24.7 | 19.7 |
| Poor judgment with money.. | 32.9 | 30.5 | 29.4 |
| Poor grooming habits...... | 16.8 | 24.0 | 18.3 |
| Rarely eats with family... | 13.7 | 13.0 | 20.1 |
| Mean social activities score .............. | 19.37 | 20.86 | 21.33 |

*Source: Davis, et.al, 1974, p. 187.

termed abnormal were: avoiding the other sex completely, homosexuality, promiscuity, or bizarre sexual indulgences. Figures for each of the groups on behaviors judged pathological were 39 percent for the drug group, 35 percent for the placebo group, and 37 percent for the controls. The researchers in this study are of the opinion that a central problem of schizophrenia is the disturbed person's inability to form a sexual indentity or to cope with sex-related roles. Most psychoanalytically based theories agree with this view, and seen from this perspective, the schizophrenic disorder can be appreciated as a serious and all pervasive problem in living socially as sexual role identification is considered to be the core of personal identity (Davis, et al., 1974).

A 1973 study by Niskanen and Pihkanen (1974) sought to compare the attitudes of family members of patients cared for in hospitals and in home treatment service. The groups under investigation consisted of 49 schizophrenics each. Personal interviews were held with the patients' closest relatives. Twenty-two of the relatives of the hospital group and 39 percent of the home treatment group considered that the treatment the patients had received had influenced favorably or very favorably their contacts with other people. Similar differences between the two groups were evident in the items dealing with the relatives' opinions of the later effect of the treatment upon the relationships between the patient and other people, as well as upon attitudes of other people toward the patient (Niskanen & Pihkanen, 1974).

Seventy-six percent of the hospital group and 57 percent of the home treatment group considered the patients to have been a burden before referral to the treatment program. At the time of the investigation, 47 percent of the hospital group and 26 percent of the home treatment group considered the patient a burden. The researchers point out that these results do not lead to the conclusion that community service generally is less burdensome to families than hospital care. It was possible to infer that in both forms of care the hardships endured by the families because of the patient had been eased by about the same degree.

Unfavorable family attitudes toward the patients were found to almost the same extent in both groups. The study indicated, however, that families exercised more tolerance as a rule toward a mentally ill female relative than toward a male relative (Niskanen & Pihkanen, 1974).

Twenty percent of the hospital group and 45 percent of the home treatment group relatives stated that their attitudes had become more lenient on account of the treatment the patient was receiving. Twelve percent of the hospital group believed that the treatment had had a harmful effect on their attitudes, but no such complaint was expressed by the home group. Though the results on this item were not statistically different between the two groups, the authors point out that home treatment did have a more favorable influence on the relationship between the patient and the family. Fifty-nine percent of the hospital group and 69 percent of the home treatment relatives considered the relationship between the patient and his family to be good or very good (Niskanen & Pihkanen, 1974).

In conclusion, the authors stated that approximately 20 percent of the hospital group and 14 percent of the home treatment group seemed to be intolerant or very intolerant of the patient, while 64 percent of the hospital group and 53 percent of the home treatment group seemed to be favorably or very favorably disposed (Niskanen & Pihkanen, 1974).

In a 1968 study, Angrist, et al. found that female mental patients showed similar profiles on domestic role performance to the profiles on normal women. However, the research also demonstrated that normal women are somewhat better domestic performers and are clearly better adjusted psychologically than were the female mental patients. Table 3-13 shows the percentage of patients in the Institute Treatment Center Study at intake that needed help on various domestic tasks (Davis, et al., 1974).

At the start of the ITC program (1962) all patients were living with families. Table 3-14 shows the percentage of patients, by group, who fell into the various living arrangement categories at the time of follow-up. The data emphasize severed familial ties. Between seven and 19 percent of the patients had divorced between the start of the study and follow-up. In each group, there were three to six percent more patients who had divorced than married by the time of the follow-up. Table 3-15 shows the percent differences in social behavior of the three groups at follow-up compared with intake (Davis, et al., 1974).

The ITC researchers also asked significant others to rate the patients' behavior at home and certain difficulties caused by the patient in the household. Table 3-16 summarizes the rank order of problem behaviors of all patients at ITC intake and at the time of follow-up (Davis, et al., 1974).

Young people are the least likely to reject the mentally ill (Woodward, 1951; Cumming & Cumming, 1957; Freeman, 1961; Whatley, 1959; Phillips, 1964; Crocetti & Lemkau, 1963). Age has proved to be the strongest single predictor of rejecting attitudes toward the mentally ill, but Chin-Shong (1968) found that older women were more rejecting than older men, and

## TABLE 3-13

## DOMESTIC TASKS ON WHICH PATIENTS NEEDED HELP AT INTAKE AT INSTITUTE TREATMENT CENTERS*

| Domestic Tasks | Home Care Drug Group | Home Care Placebo Group |
|---|---|---|
| Cleaning house............ | 52.8 | 42.3 |
| Cooking meals............. | 50.0 | 40.7 |
| Laundry & cleaning........ | 47.1 | 32.0 |
| Grocery shopping.......... | 55.2 | 45.5 |
| Other shopping............ | 43.8 | 32.0 |
| Budgeting & paying bills.. | 50.0 | 43.5 |
| Planning daily activities. | 61.8 | 32.1 |
| Solving daily problems.... | 62.9 | 40.7 |

*Source **Davis, et** al., 1974

## TABLE 3-14

## PATIENTS' LIVING ARRANGEMENTS AT ITC FOLLOW-UP (1969)*
(In Percent)

| | Drug Group N=57 | Placebo Group N=41 | Controls N=48 |
|---|---|---|---|
| Alone...................... | 11.4 | 7.3 | 16.9 |
| With spouse................ | 43.2 | 36.4 | 36.8 |
| With parents............... | 16.0 | 19.5 | 20.4 |
| With children.............. | 11.4 | 14.8 | 0.0 |
| With relatives............. | 5.3 | 6.4 | 6.3 |
| Group situation............ | 7.9 | 8.7 | 6.8 |

*Source: Davis, et al., (1974), p. 62

## TABLE 3-15

## SOCIAL BEHAVIOR OF PATIENTS AT FOLLOW-UP (1969) COMPARED WITH ITC INTAKE (1962)*

## (In Percent)

| Social Behavior | Drug Group N=57 | Placebo Group N=41 | Control Group N=48 |
|---|---|---|---|
| Social activities scores improved since ITC intake............... | 1.0 | 8.7 | 3.6 |
| Friendship pattern same to worse since ITC intake............... | 59.9 | 51.0 | 58.7 |
| Divorced or separated since ITC terminated..................... | 19.4*** | 6.6*** | 12.5*** |
| Has married since ITC terminated.. | 13.4** | 3.7** | 7.7** |
| Remained single (lifetime)........ | 28.4 | 51.3 | 39.3 |
| Psychopathology caused changes in close familial ties since ITC terminated..................... | 27.9 | 23.3 | 17.9 |

** Differences significant at .05 level.
*** Differences significant at .01 level.

* Source: Davis, et al., (1974), p. 62

## TABLE 3-16

## PROBLEM BEHAVIORS OF ALL PATIENTS RANKED AT ITC INTAKE (1962) AND AT FOLLOW-UP (1969)*

| | RANKS | |
|---|---|---|
| PROBLEM BEHAVIOR OF PATIENTS | ITC Intake N=120** | Follow-Up N=146 |
| Causes SO a lot of worry...... | 1 | 1 |
| Speaks and Behaves oddly...... | 2 | 4 |
| Troublesome at night.......... | 3 | 5 |
| Talkative and restless........ | 4 | 3 |
| Excess physical complaints.... | 5 | 10 |
| A physical strain on the SO... | 6 | 11 |
| Upsets Household.............. | 7 | 9 |
| Safety causes worry........... | 8 | 7 |
| Uncooperative................. | 9 | 2 |
| Strain due to dependency...... | 10 | 6 |
| Requires excessive attention.. | 11 | 8 |
| Sexually rude and improper.... | 12 | 15 |
| Causes worry about safety of others.................. | 13 | 13 |
| Causes absence of others from work.................. | 14 | 22 |
| Upsets social life............ | 15 | 14 |
| Causes children's absence from school............... | 16 | 18 |
| Causes trouble with neighbors................. | 17 | 20 |
| Nursing problem............... | 18 | 21 |
| SO is ashamed of patient...... | 19 | 19 |
| SO fears patient.............. | 20 | 17 |
| Children ashamed of patient... | 21 | 12 |
| Children fear patient.......... | 22 | 16 |

**Not all patients were tested on problem behaviors at ITC intake; this accounts for differentials and increased N's at follow-up.

*Source: Davis, et al., (1974), p. 186

that black women were more rejecting than black men. Blacks of both sexes have been reported to express more rejecting attitudes than whites (Ramsey & Siepp, 1948; Crawford, Rollins & Sutherland, 1960; Whatley, 1959).

A higher level of education has been positively correlated with more favorable attitudes toward mental illness (Davis, 1938; Cumming & Cumming, 1957; Phillips, 1964), but Dohrenwend and Chin-Shong (1967) found that education had a small negative correlation with rejecting of the mentally ill. Other researchers have found little or no correlation (Freeman & Kassebaum, 1960; Nunnally, 1961).

In a 1967 study in New York, Elinson, Padilla, and Perkins found that a majority of their subjects held the belief that mental illness was an illness like any other illness. The respondents generally agreed that there were different kinds of mental illness and that payment for psychiatric treatment should be included in regular health insurance coverage. However, a majority thought there was little that could be done for the mentally ill. Eighty percent stated that they would be willing to work with a former mental patient; 64 percent would be willing to hire him; 43 percent to work under him; and, 69 percent to have a former mental patient as a neighbor. Despite these relatively favorable attitudes, 52 percent said they would not be willing to have a former mental patient marry into their family, and 53 percent were not willing to share an apartment with a former mental patient.

Edgerton and Bentz (1969) found that 75 percent of their respondents responded negatively to the idea that little could be done for the mentally ill. Sixty-five percent felt that most discharged mental patients would make a good adjustment to the community. A significant number of the respondents (88%) stated that they would be willing to work with someone who had been mentally ill. Sixty-seven percent would be willing to rent an apartment to him; 57 percent to room with him; and 44 percent could conceive of falling in love with a former mental patient.

Gurin, Veroff, and Feld (1960) found that the public had greater knowledge about mental health and the mentally ill as well as improved attitudes toward mental illness. However, the authors also feel that the public's emotional reactions had not yet completely caught up with its newfound knowledge. Meyer (1964) also found the public knowledgeable about mental illness and generally accepting of the mentally ill. Freeman and Simmons (1961) in an interview study with relatives of former mental hospital patients, found that only a small proportion of their sample felt stigmatized by having a mental patient in the home.

Nunnally (1961) concluded that public attitudes toward the mentally ill were negative and pointed out that the public seemed more uninformed rather than misinformed about mental illness. Cumming and Cumming (1957) also found that the public's attitudes were characterized by the denial, isolation, and insulation of mental illness. On the other hand, Meyer (1964) found the public knowledgeable about mental illness and generally accepting of the former mental patient. Seventy-six percent of the sample did not feel that all mentally ill persons were dangerous; 88 percent disagreed with the locked-door system; and, 89 percent were in favor of home care (Chin-Shong, 1968).

## VII. Technologies

1. Insulin
2. Electroconvulsive Therapy
3. Psychosurgery
4. Individual Psychotherapy
5. Group Psychotherapy
6. Milieu Therapy
7. Drug Therapy: chlorthraxine, perphenazine, prochlorperazine, trifluopromazine, trifluoperazine, promazine, mepazine.
8. Occupational therapy
9. Megavitamin therapy
10. Behavior therapy
11. Special Education of childhood schizophrenia
12. Brief hospitalization

Source: Solomon, M.H. (eds.) Drug and Social Therapy in Chronic Schizophrenia Springfield, Ill.: Charles C. Thomas, 1965.

## VIII. Service Delivery

Schizophrenics comprise a major portion of the patient population in state and county mental hospitals. In 1969, almost one-half (48%) of the total resident population in these hospitals were schizophrenics. There was some variation by age, with only 25% in the under 15 age group compared with almost 60% in the 25-54 age group. Furthermore, the majority of additions and patient care episodes still remain in the area of inpatient services, with the state and county mental hospitals caring for the majority of the schizophrenic patients, followed by general hospitals and VA hospitals (Taube, 1973).

However, there is a trend toward the utilization of other facilities to care for schizophrenic patients, resulting in some reduction of their numbers in state and county mental hospitals (Taube, 1973). Most of these programs aid the schizophrenic patient who has been discharged from an inpatient service facility, but needs additional assistance. These centers include: halfway houses, day or night hospitals, sheltered workshops, rehabilitation centers, outpatient services, day care programs, and community mental health centers.

Half-way houses: As of 1970, there were 500 of these facilities in the United States, with approximately 1/4 primarily serving the mentally ill. However, there are no specific figures on the number of schizophrenics served by these facilities (Gunderson, et al., 1974; Tabue, 1973).

A majority of the psychiatric and mixed halfway houses (mentally ill, alcoholics, and other disabilities) are located east of the Mississippi River, with over 50% of all types of half-way houses situated in population areas of 100,000 and over (Gunderson, et al., 1974; Taube, 1973).

Outpatient psychiatric services: While outpatient services are increasingly being used for the care of schizophrenics, they have been criticized for being few in number, offering few advantages over inpatient facilities, and contributing very little to the facilitation of social contact among clients and society, rehabilitation, and/or recreation.

Day care programs: The number of these programs has increased over 300% in recent years, but very few schizophrenics are utilizing this form of service delivery. Taube (1973) reports that only 2.6% of the total schizophrenic additions to all mental health services and 2.2% of the total schizophrenic patient care episodes in all mental health services use these programs.

Community mental health centers: These centers provide a number of services: inpatient, outpatient, partial hospitalization, and day care centers. Between 1969 and 1970, the number of people admitted to community health centers increased by 32%, with a 39% increase (reaching a total of 51,000) in the number of schizophrenics treated at the centers. Almost 10% of these schizophrenic patients received day care services, while 53% were outpatients and 37% were inpatients. It is possible these centers will assume an increasing role in the treatment and aftercare of schizophrenics. This will be brought about by the implementation of effective programs to care for schizophrenics discharged from state and county mental hospitals; and may well result in a decrease in the readmission rate (currently 35 per 100,000 population) for schizophrenics, thereby effecting the overall utilization of state and county mental hospitals (Taube, 1973).

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